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STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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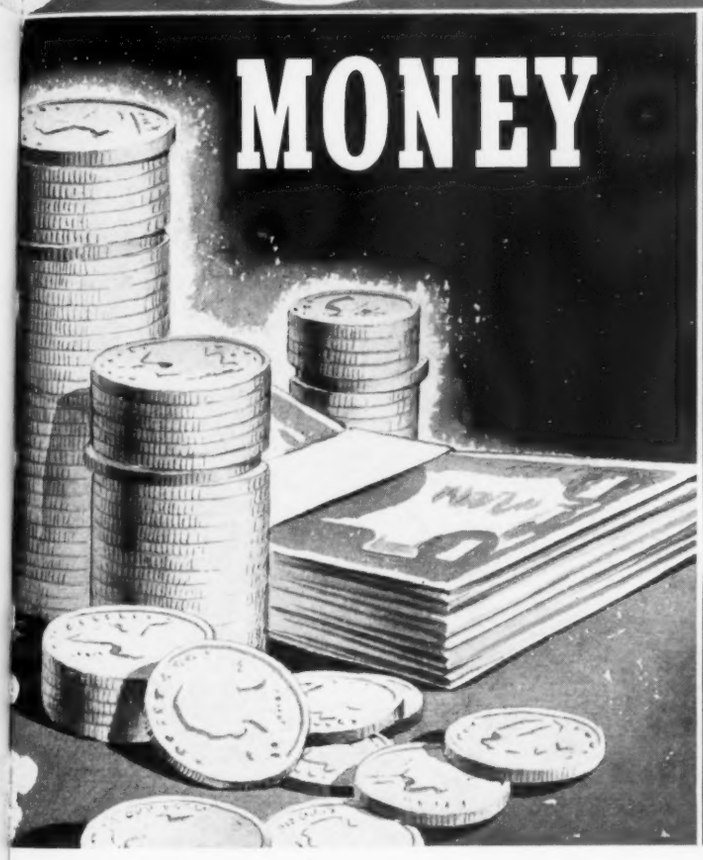

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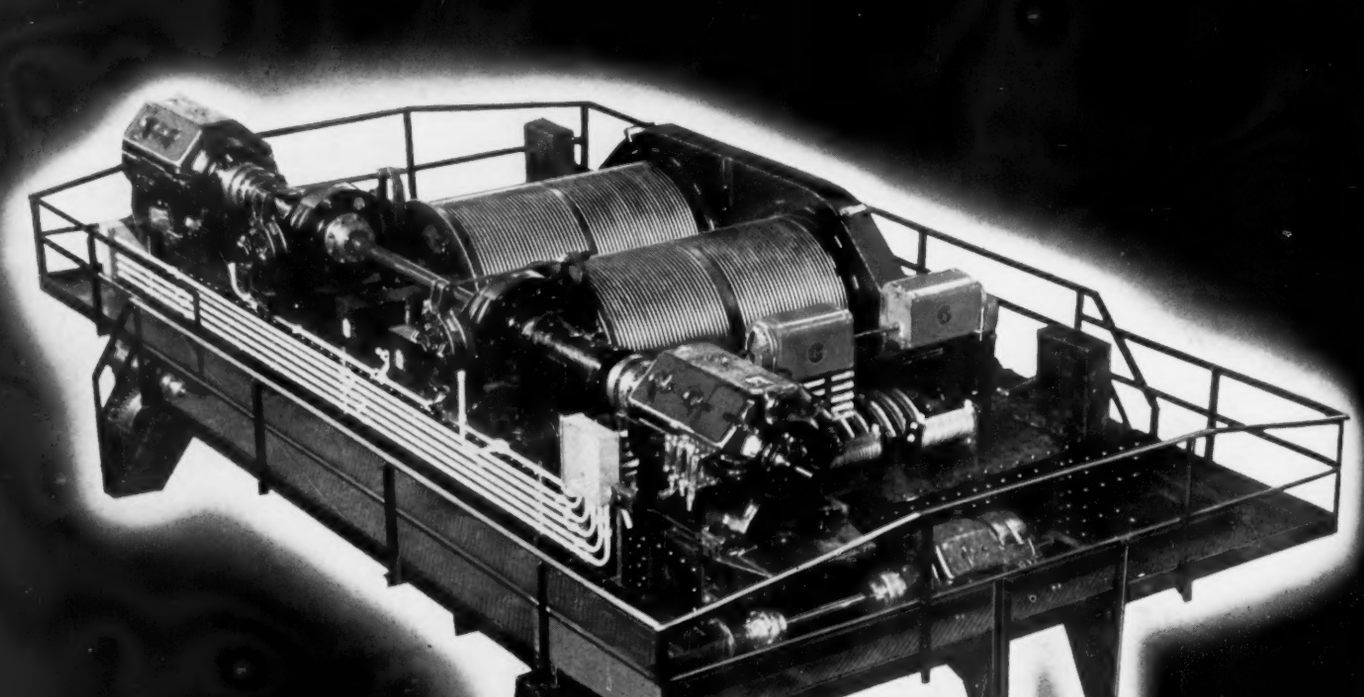

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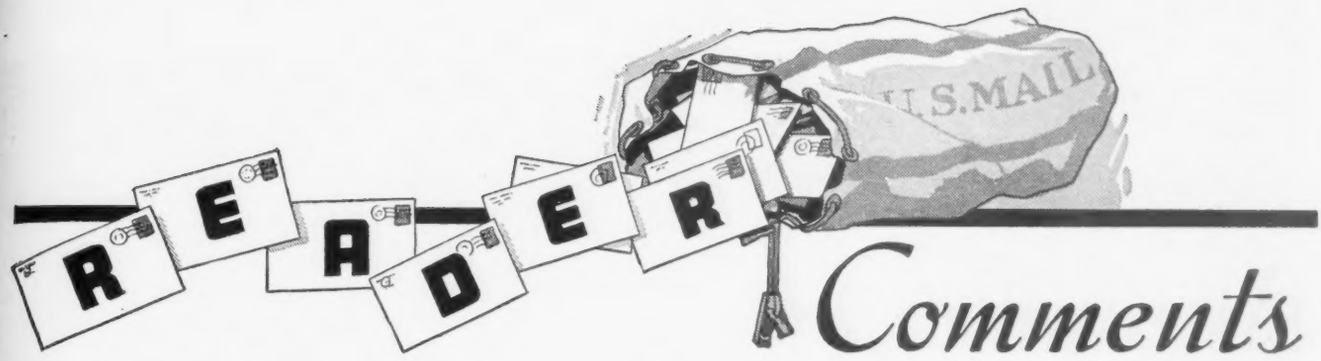

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Puts it up to Congress

To the Editor:

We agree 100 per cent with your editorial in the March 28 issue of STEEL, referring to the burden of tax and necessity for reducing cost of government. I am enclosing copy of a letter we have recently addressed to 33 representatives and six senators:

The letter is in part as follows:

"Practically all of the factories in this territory, including our own, are suffering from present business conditions, and as a result are giving work to only a small percentage of the number of men and women usually employed.

"The process of 'pump priming' has been tried, with only temporary results, and it is now proposed to try it again. To make this process possible, it was necessary to greatly increase taxes, resulting in unworkable and unwise legislation, covering capital gains and undistributed profits.

"To continue this policy can result in only one thing, national bankruptcy.

"If the congress will offer and adopt a sane tax program, which will give business some assurance of security, and knowledge that they will be in a position to rehabilitate their present depleted and exhausted financial condition, I feel sure that as soon as this assurance is given, prosperity will return to the country.

"While we are a relatively small company, our business is almost exclusively with the largest steel mills, fabricating shops and automotive plants in the country.

"The number of inquiries which we have been receiving during the past year has kept our engineering and estimating department operating at full time. The actual orders placed, however, have been very disappointing, and in practically all cases the answer has been somewhat as follows:

" 'We are pleased to receive your proposition, which meets with our approval, and as soon as business conditions will permit, we expect to proceed with the purchase of this equipment.'

"Were it not for the foreign business which we have recently received from Great Britain, Japan and the USSR, we would have practically no work in our plant.

"The time has come for some definite action on the part of congress, to correct this condition, and we sincerely hope that you will support a measure which will make possible the return of prosperity, and in so doing, the re-employment of the many who are now unemployed."

H. W. KANE

Secretary, Kane & Roach Inc.,
Syracuse, N. Y.

Steelworker Skill Rising

To the Editor:

An item in STEEL, May 2, page 18, states the American Iron and Steel institute has figures showing that of every ten employes in the steel industry seven are native-born and two are naturalized.

Time was, and well within the memory of men still active in the industry, when the proportion was far different. One cause for the change is the larger proportion of skilled labor now employed in steel mills and the smaller relative number of common laborers. Naturally the latter would be recruited from those recently coming into the country, who have not had opportunity to fit themselves for skilled positions.

The greater percentage of skilled workers results from the development of machine equipment to perform the more laborious tasks about the mills, requiring supervision rather than muscular effort.

Yet statistics show that each ton of steel now produced requires more man-hours than a few years ago, mechanizing not having reduced the number of workers, but increased them. The reason for this is that a ton of sheets or strip requires more processing than a ton of steel rails. Formerly much of the output was in heavy products but now lighter flat-rolled steel is in the ascendent.

Another factor in increasing the proportion of native-born is the sharp restriction on immigration, which has reduced the number of incoming aliens, thus limiting the number available for employment. It may be that this shortage of workers unsuited for employment other than common labor has been a factor in forcing development of mechanical substitutes for manpower.

In the main, steelworkers are of high type, conversant with American ways and ideals and better workers than those of a generation or two ago, who were alien in birth and ideas. This may be one of the causes of the efficiency of the industry.

PERSONNEL DIRECTOR

Pittsburgh

Steel House Will Win

To the Editor:

Development of various types of steel houses is making progress in the right direction and eventually will succeed. Conservatism has to be met and overcome and because a steel house has a different appearance from the traditional frame or brick some of us think it less beautiful.

However, compare the steel automobile today with the best creation of ten or 15 years ago and see the change. The steel house will undergo as much development until it is accepted as a matter of course.

The various articles in STEEL on progress in design are valuable in keeping the public informed as to what is being accomplished as each step is taken.

STEEL BUILDER

Milwaukee

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Columbian Steel Tank Company, Kansas City, Mo.
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STEEL

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

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The Isley System is recommended for melting and re-heating furnaces in the metal, glass and ceramic industries. It is adaptable to all types of fuel and is ideal where only cold blast furnace gas is available.

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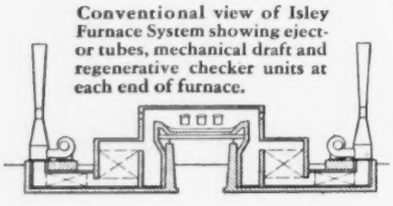
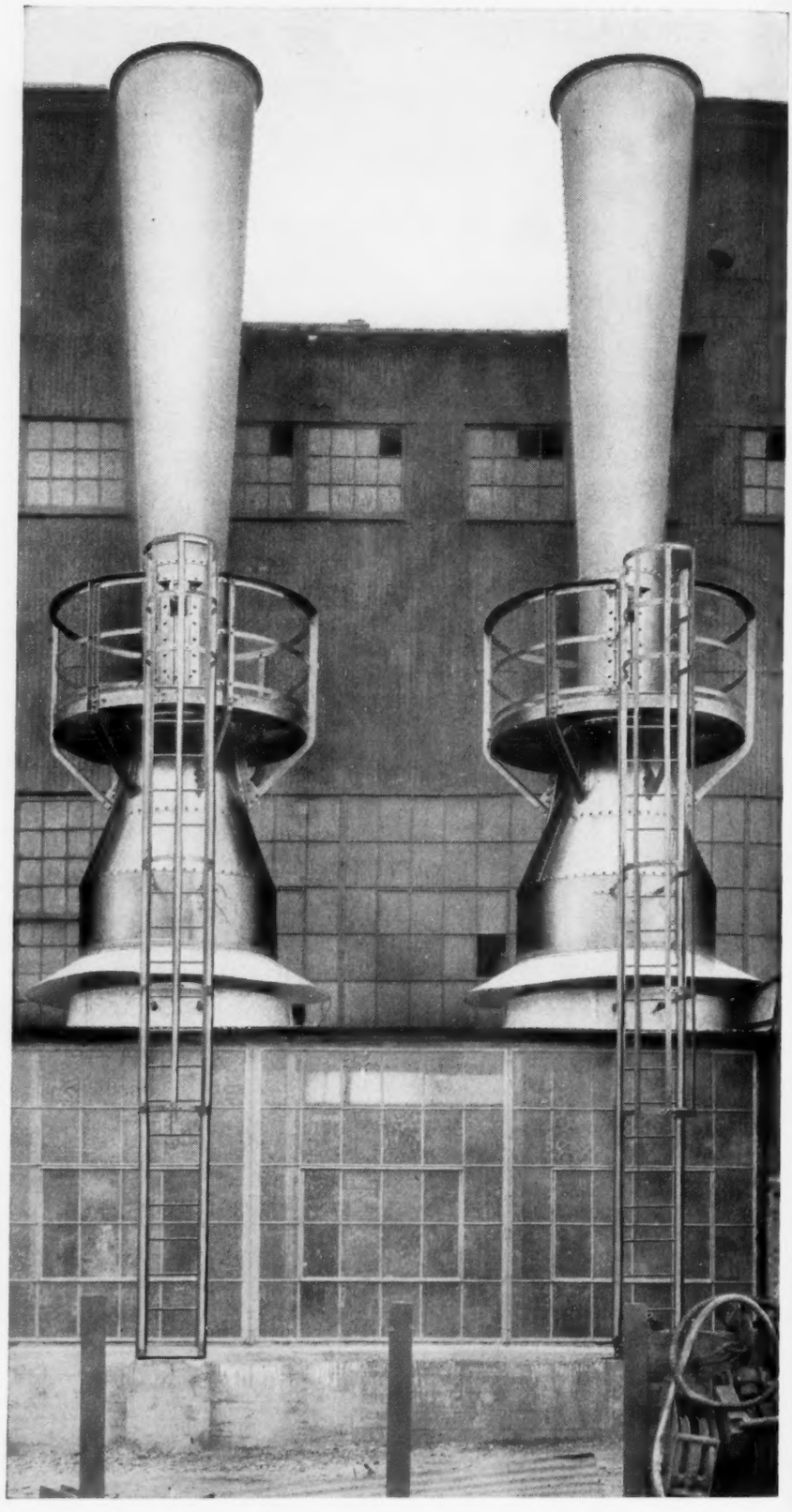


Conventional view of Isley Furnace System showing ejector tubes, mechanical draft and regenerative checker units at each end of furnace.



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ISLEY *Furnace* MORGAN WORCESTER ENGINEERS AND MANUFACTURERS *System*

V7

As the Editor Views the News

■ THE AUTOCRATIC career of the national labor relations board in its policy of conducting one-sided hearings was slowed down perceptibly last week as a result of the Supreme Court's decision in the stockyards case. The court threw out Secretary Wallace's maximum rates for marketing agencies on the ground that the latter did not have a fair hearing. The court characterized the Wallace order as "more than an irregularity in practice" and as "fatally defective." Current indications (p. 24) are that the decision will influence materially the labor board's future activities, and that it will affect the fate of some of its important recent rulings . . . Chamber of Commerce of the United States (p. 33) asked congress to investigate the labor board and to repeal the labor relations act.

• • •

Big Bonds; Little Cars

Of importance was the news that the United States Steel Corp. (p. 24) would file a registration statement covering a $100,000,000 bond issue to be offered in June. This development was hailed widely as forerunner to a freer investors' market. . . Chief news in the automotive industry (p. 29) is the plan of the Crosley Radio interests to place a small car in production. It is to sell for $250, will have a 2-cylinder motor with guaranteed fuel economy of 50 miles per gallon . . . The annual meeting of the American Steel Warehouse association was featured by a clarification of the respective functions (p. 18) of steel mills and jobbers . . . April pig iron output (p. 20) fell off 2.5 per cent, and 11 furnaces went out of blast.

• • •

45,000 Tons For Vessels

Sudden expansion of trading on the stock exchange, accompanied by a rising price trend, afforded a degree of cheer late Friday. Volume of business in steel, however, shows no improvement. Last week's ingot output (p. 21) was at the rate of 31 per cent, a further drop of 1 point. Featured in new business (p. 71) is the award of eight merchant vessels which will require 45,000 tons of steel. Considerable additional ship work is pending . . . Greater attention is being given to national defense. Now under consideration in congress is a provision to place "educational orders" for war munitions. The purpose is to encourage installation of needed equipment and training of mechanics at 10,000 plants earmarked to produce war materials, shortening the period of delay in event of an emergency.

• • •

Combustion Improved

Steel engineering is a term heard frequently to denote the replacement of old rule-of-thumb by scientific methods. Today we have open-hearth furnaces (p. 38) that regularly produce more than 13,000 tons of ingots per month with about 60 per cent of the B.t.u.'s that once were necessary. This is due to advancement in combustion, where the regulation of the furnace is taken out of the hands of the first helper and is done with automatic control. Instrumentation is bringing closer control and improved quality in steel production . . . Welded structural design, due to provisions in building codes, has lagged behind the progress of welding in industrial fabrication; too, there seems to be a need (p. 44) for special structural shapes designed especially for welding.

• • •

Machine Cleans Steel

A new machine (p. 47) has been developed for the special purpose of removing rust from steel in jobbers' stocks. First used in Cincinnati in 1936 in cleaning steel damaged by flood waters, it now is made in designs capable of cleaning 100 to 200 tons per day . . . One of the notable features of a new continuous strip mill (p. 56) is the extent to which safety has been engineered into the buildings and the mill. Expenditures for safety prove to be good investments . . . Unusual fixtures (p. 60) speed sheet welding at the plant of a stoker manufacturer. Speed clamps and releases facilitate the operation of jigs . . . An engineered method of installing drive and shafting supports in conjunction with carefully planned group drive system cuts first costs as well as fixed charges.

E. L. Shaner

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- Channels, Angles, Tees and Zees
- Rails, Splices, Spikes, Bolts, etc.
- Plates—Sheets
- Strip Steel, Flat Wire, etc.
- Boiler Tubes and Fittings
- Welding Rod—Mechanical Tubing
- Rivets, Bolts, Nuts, Washers, etc.
- Reinforcing Bars
- Babbitt Metal and Solder

RYERSON STEEL-SERVICE

Tool Builders Hear of Mobilization Plans "If and When" War Comes

■ THE STATE of national defense and preparations under way to enable this country to protect itself against possible aggression by foreign powers received serious consideration at the thirty-sixth spring convention of the National Machine Tool Builders' association, in Chicago, May 2-3.

Those contributing to the discussion were Louis Johnson, assistant secretary of war, Washington, Walter W. Tangeman, vice president, Cincinnati Milling Machine Co., Cincinnati, and Clayton R. Burt, president, Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn.

The subject also was touched on in the presidential address of Howard W. Dunbar, vice president, Norton Co., Worcester, Mass., and in the report by Tell Berna, the association's general manager.

A survey of arsenals in the United States reveals that, even though they were equipped with the most modern machinery and fully staffed, they would be unable to produce more than 10 per cent of the army's requirements in time of war. The function of the arsenals, therefore, is that of serving as experimental laboratories. For the other 90 per cent of the munitions required in an emergency the army will look to civilian production.

Greatly Encouraged

"We have made a survey of American industry and are greatly encouraged by our findings," said Mr. Johnson. "We feel that with proper education industry can carry a major war load and take care of our civilian as well as our military needs in emergency. We have earmarked 10,000 plants for war production. We have informed their managers and proprietors as to the tasks to be imposed upon them in the event of war. All are eager to co-operate with the war department in this important job.

"The plan is complete on paper. You, as practical toolmakers, know from experience that the best paper plans may be full of holes and when put into effect may show many weaknesses. Our plan calls for the production of many items for which there are little or no peace-time demands.

"There is little call for smokeless powder in times of peace and production, therefore, is limited. There is relatively little demand for ammunition for rifles and machine guns and consequently there are relatively few establishments for their production. Yet success of our battle effort will be largely dependent on our ability to produce in great quantity smokeless powder and small arms ammunition.

Time Important

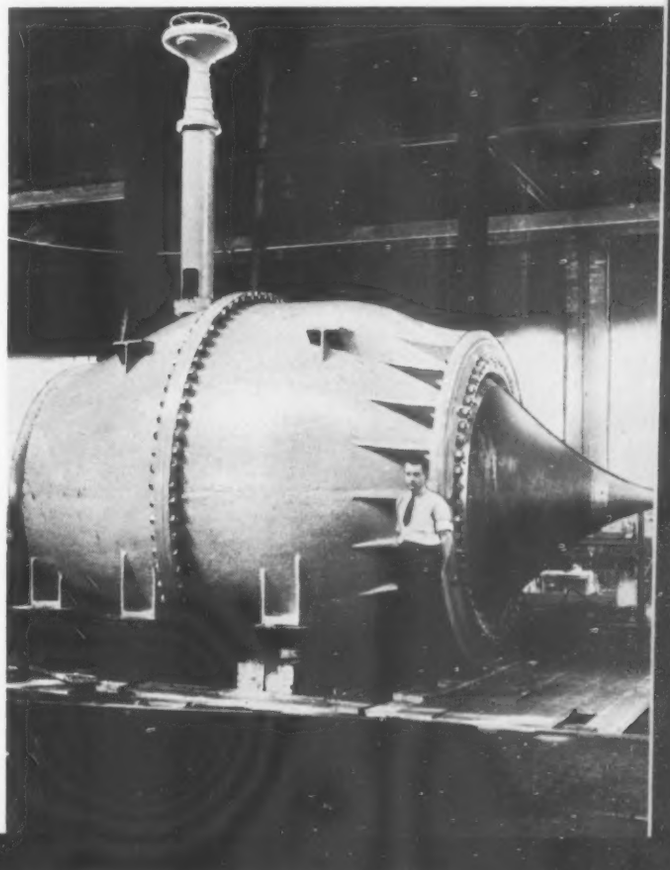
"We are confident that American industry can do the job if it has time enough to build its further facilities. Time is of the essence of industrial mobilization. The successful conquest of time in the early days of the war will save thousands of valuable lives and untold millions of treasure.

"We have always boasted of our ability as manufacturers. Our World war record, however, left much to be desired. We were fortunate in our allies. If an emergency should again arise we can hardly expect that our shores will be similarly protected by friendly powers for 14 months while we have an opportunity to marshal for war purposes our tremendous industrial assets."

There is every indication, said Mr. Johnson, that the present congress will act upon the President's recommendations of Jan. 28 and will pass legislation which will go a long way toward reducing delays in industrial mobilization. The current war department appropriation bill which has passed the house and senate and now is in conference will provide $6,500,000 to $3,000,000 for gages, dies, jigs and fixtures and other tools, so that they will be ready for immediate use in emergency.

For adequate volume production of the army's new semiautomatic rifle, which makes one soldier in

Needle Valve Weighs More Than 75 Net Tons



■ **This valve, one of the largest of its type ever built, recently was completed by Hardie-Tynes Mfg. Co., Birmingham, Ala., to be installed at the San Gabriel dam, Azusa, Calif., for Los Angeles county flood control. Diameter of the inlet is 102 inches, and of the discharge, 90 inches**

battle equivalent in effectiveness to five men equipped with the Springfield rifle, Mr. Johnson said 2345 different gages, 1766 different fixtures, 1388 special tools and cutters and 79 punches and dies will be required for making and assembling the 74 parts.

"As a further encouragement to production the war department, we believe, should have authority to place in peace time what are known technically as 'educational orders,' with those plants which must have the necessary gages, tools, dies and fixtures," he continued. "In principle, the educational order is a non-competitive order for a limited number of units of a particular product of a non-commercial nature that could be placed with a specific company to enable it to acquire skill and experience in making this particular product.

"The orders will be small but the experience gained will enable a plant to produce in quantity when the needs arise. The orders will be placed, not on the basis of profit to the company but at a price that would enable it to cover its out-of-pocket expenses.

"Legislation authorizing educational orders would go a long way toward solving the unknown factor in the equation of industrial mobilization. Legislation granting this authority is now before congress and the house committee has acted upon it favorably."

Mr. Tangeman commented in some detail on the conferences of machine tool builders with the planning division of the army industrial college, comprising officers of the army, navy and marine corps. Arsenals and navy yards are full of obsolete equipment and the necessary modernization will require substantial appropriations.

Our neutrality policy prevents manufacturers from making war materials for foreign countries, thus robbing them of incentive to equip for such work, he said. No preparation can enable manufacturers to proceed as far as the actual requirements will necessitate after an emergency arises. In other words, the state of readiness of our industries for mobilization day will depend largely on what congress does to encourage such preparation.

It was pointed out by several speakers that the present time of minimum demand for machine tools is a good one for encouraging military preparation. In particular, modernization of arsenals, navy yards and other government plants would encourage machine tool builders to keep intact their forces of mechanics and train additional mechanics.

To indicate the necessity for large-scale efforts if this country is to be prepared to defend itself, Mr. Burt showed many photographs of operations which were entailed in manufacturing munitions during the World war. He referred to the difficulties encountered in the early phases, when mechanics had not yet had thorough training and before many single-purpose tools, that later simplified the work, had been developed.

Other discussions stressed the need for large congressional appropriations if the defense problem is to be solved effectively.

Those at the convention were impressed particularly by the remarks of an English machine tool builder. Although England has been rearming for the past two years, he said, it will require another year and a half before it is strong enough to defy "international bullies."

Howard W. Dunbar, president of the association, expressed the opinion that the machine tool curve has about reached its bottom and that the next movement will be in the upward direction.

This conclusion was based in part on an analysis by Frida F. Selbert, secretary of the association, who showed the machine tool sales curve has leveled off and is moving sidewise. This is a good time, Mrs. Selbert advised, for machine tool builders to study their own plants and the plants of customers. Curves, incidentally, indicated that the machine tool industry has three bad years for every two good years.

To Keep Prices Low

Viewing the immediate future, Mr. Dunbar said: "We are resolved to keep our prices as low as is consistent and to compensate for rising costs by better management. There are still possibilities for reduction in costs by better equipment, better training of men, wise administration of payment systems and attention to personnel methods in securing cooperation with workers. Our factories must become places where men like to work, where workers will have pleasure rather than pressure."

Mr. Dunbar was convinced that the price ceiling has been reached and that profits must be maintained by improved manufacturing facilities and lower production costs. Competition will be keener in the months to come, he said, and the law of supply and demand is bound to have a leveling influence on prices. Straight thinking, however, will some day lead to the conclusion that commendation should go to those who make substantial rather than small profits, for wage payments are largest when industrial profits approach a satisfactory level. He warned against bargain-day ideas, saying that price cutting does not beget confidence.

While reports indicate that most of the undesirable bills now before congress will not be passed at this session, vigilance is needed to insure this result as well as to provide against undesirable bills in the future. Norman D. MacLeod, president, Abrasive Machine Tool Co., East Providence, R. I., pointed out that the recent ruling on government purchases of cement may be the forerunner of similar rulings af-

Beaching 41-Ton Clipper on Welded Steel Gear

■ **Twelve 15-ton steel beaching gears are being constructed for Pan-American Airways by Kenworth Motor Truck Corp., Seattle, for launching and docking the line's new 41-ton clipper planes. The units are amphibian, equipped with wheels and flotation tanks. To obtain the necessary high torsional rigidity, welded design was adopted. About 175 pounds of the General Electric type W-20 shielded-arc electrodes were used in fabricating each gear**

fecting other products. He stressed the advisability of having congressmen visit manufacturing plants, such visits resulting in a better understanding of industry.

William J. Kelly, president, Machinery and Allied Products institute, warned that while patent legislation is not expected this year, widespread opinion prevails that the period stipulated in the existing patent law should be shortened, so that manufacturers should be on their guard.

Although congress is approaching adjournment there still is a chance that bills now regarded as "dead" may be revived; due to the general disposition of this congress to do as much as it can for labor, he stated. Should the Wagner act be modified to include certification of government contractors by the labor board most machine tool builders would consider it unwise to sell to the government.

Mr. Kelly advised a continuance of educational work. While there has been a change in the impression that machines destroy jobs, there is a general feeling machines cause serious dislocations in employment, and that machinery therefore should be made to pay the bill for such dislocations. Mr. Kelly also stressed the importance of obtaining a reform in the securities and stock exchange law so as to pave the way for freer flow of capital.

The association authorized the president to appoint a committee to set up a fact-finding and research program aimed at stimulating sales of machine tools. This action followed a paper by J. Y. Scott, executive vice president, Van Norman Machine Tool Co., Springfield, Mass., which indicated that the machine tool industry is weak in sales-planning and development.

Much attention was given to leveling out the machine tool sales curve which traditionally is one of sharp peaks and valleys. A. G. Bryant, president, Associated Machine Tool Dealers, reported this organization is conducting sales clinics to improve sales technique and stabilizing demand.

How Demand Has Fluctuated

"Machine tool sales in January of 1938 amounted to $3,600,000 as compared with $19,000,000 in April of 1937," he said. "It is our problem to find the answer to this violent fluctuation."

A revised form for builder-dealer relations is being studied and should be ready for use in the near future, said Henry C. Pierle, vice president, R. K. LeBlond Machine Tool Co., Cincinnati. This should be more in line with the interests of dealers.

The machine tool builders have been adequately represented before the committee of the state department which has charge of reciprocal tariff agreements, according to L. W. Scott Alter, president, American Tool Works Co., Cincinnati. As a result the industry is being guarded against any harmful arrangements.

Clifford S. Stilwell, vice president, Warner & Swasey Co., Cleveland, gave a report on the association's publicity and educational work. This has been conducted jointly with other organizations. It comprises speeches, radio broadcasts and printed material, all aimed at educating the general public in the importance of healthy industries. The association, Mr. Stilwell stated, is co-operating in setting up a permanent machine tool exhibit at the Museum of Science and Industry, Chicago.

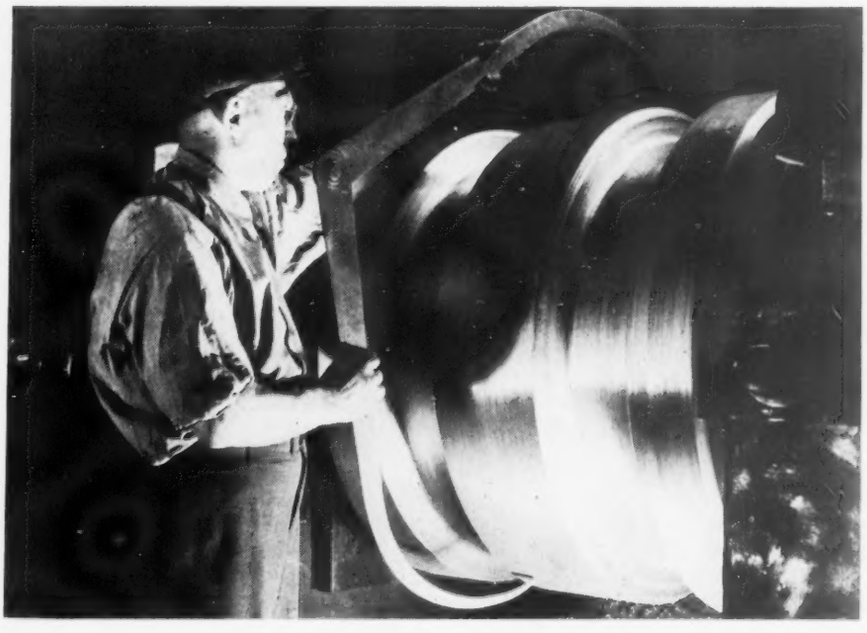
Technical standards applicable to machine design were reviewed by J. E. Lovely, vice president and chief engineer, Jones & Lamson Machine Co., Springfield, Vt. Cut and ground thread standard, he said, now is in process of revision. He suggested that engine lathe builders who favor other than the present standard form of spindle nose apply to have an alternate standard set-up.

Pending is a standard for spindle ends on drilling and horizontal boring machines. Manufacturers are reluctant to adopt machine taper standards now existent and he thought the number of such standards might well be increased. He also thought that spindle ends on milling machines might be standardized, as is the case abroad.

There now is a disposition to increase the size of machine tool motor terminal boxes, a change not favored by machine tool builders, said B. N. Foster, chief engineer, Kingsbury Machine Tool Corp., Keene, N. H.

Mr. Dunbar reported that conferences with the National Electrical Manufacturers' association should prove helpful in working out these and other design problems associated with electric wiring and terminal connections.

Fifty-eight, Twenty-five and Forty-two



■ This interesting picture shows a worker at his lathe in the Ford Motor Co.'s rolling mill at Dearborn, Mich. He is 58, has been a Ford employe 25 years, and with huge calipers is seeing to it that the 42-inch roll is redressed perfectly. More than 50,000 tons of steel passed under this roll before it became necessary to slice off as much as 3/8-inch to smooth the surface. Rolls of this type convert 10-inch ingots into 5½-inch blooms for making gears and small parts

New Streamliners To Give Smoothest Ride

■ Mechanical improvements in new streamlined trains being built by Pullman Standard Car Mfg. Co., Chicago, for the New York Central and Pennsylvania railroads are claimed to provide smoother riding than any other type of railroad equipment. Couplers consist of a large ball and socket which, with liberal use of rubber, reduces noise and jolts in starting and stopping. Each truck contains 16 heavy coil springs and two elliptic springs. The new trains will start operation June 15 on the Twentieth Century Limited and Broad Limited.

Warehouses as Stabilizing Influence; "Serve with Ideas, as Well as Steel"

■ WAREHOUSE steel sellers are destined to play an increasingly important part in finished steel products distribution. They are in close personal contact with the ultimate consumer; they know his needs; they are in a position to render unrivaled service; they can develop new uses and outlets and already have pioneered in creating and expanding consumer markets.

Such was the consensus of speakers at the 29th annual convention of the American Steel Warehouse association Inc., Waldorf-Astoria hotel, New York, May 3 and 4.

A. O. Fulton, of Wheelock, Lovejoy & Co., Inc., Cambridge, Mass., was elected president of the association. A. C. Castle, A. M. Castle & Co., Chicago, and Guy P. Bible, Horace T. Potts Co., Philadelphia, were elected vice presidents. John A. Thiele, Miami-Dickerson Steel Co., Dayton, O., was named treasurer.

Other members of the executive committee include: Charles Heggie, Scully Steel Products Co., Chicago; Ralph J. Stayman, Jones & Laughlin Steel Corp., Pittsburgh; Everett D. Graff, Joseph T. Ryerson & Son Inc., Chicago; Lester Brion, Peter A. Strasse & Co. Inc., New York; C. C. Dodge, George F. Blake Co. Inc., Worcester, Mass.; J. Frederick Rogers, Beals, McCarthy & Rogers Inc., Buffalo; E. L. Parker, Edgar T. Ward's Sons Co., Pittsburgh.

Elected to serve as directors-at-large for 3-year terms were Messrs. Dodge, Heggie and Castle.

Walter S. Doxsey was re-elected executive secretary.

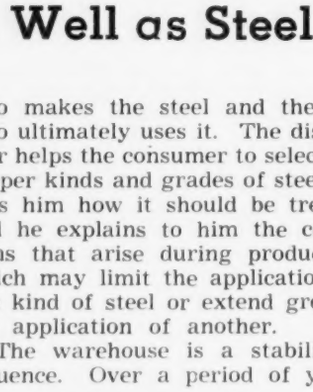
Jobbers Stabilizing Influence

"If the mills may be said to be the heart of the steel industry, it may be said with equal truth that the distributors are the arteries. Their strength is vital to the health of the whole industry, and the mills on their part will do everything possible to protect and enhance your business future," declared J. V. Honeycutt, assistant vice president, Bethlehem Steel Co.

"For the steel industry, the warehouse fulfills several valuable functions. It is a pioneering force, carrying to the highways and byways of industry the many new products that have been developed in mill laboratories, and exploring the channels of trade for new applications, thus enlarging markets for steel and at the same time aiding the thousands of users of steel.

"Linking the steel producer with the steel consumer, the distributor helps materially in creating a mutual understanding between the man who makes the steel and the one who ultimately uses it. The distributor helps the consumer to select the proper kinds and grades of steel; he tells him how it should be treated and he explains to him the conditions that arise during production which may limit the application of one kind of steel or extend greatly the application of another.

"The warehouse is a stabilizing influence. Over a period of years



A. O. Fulton

Elected president, American Steel Warehouse association

there are fewer fluctuations in the demands of distributors than in the demands of almost any other branch of industry served by the mills. At present steel producers are running their plants at 30 to 35 per cent of capacity. Your industry, I understand, is maintaining a sales volume of between 60 and 65 per cent of what it was a year ago. Mill production has dropped about 70 per cent; your activities have decreased 35 or 40 per cent in the year.

"While steel operations are only slightly above 30 per cent, I think it may safely be said that the markets for steel today are giving us double the tonnage than would be the case if our operations were limited to the old-line heavy steel products."

Necessity for carrying heavy inventories and many kinds of steel may be a "headache" to jobbers, admitted the speaker. But the greater range in inventories also enhances the warehouse's significance and importance and enlarges the jobber's opportunities.

J. Frederick Rogers, vice president, Beals, McCarthy & Rogers Inc., Buffalo, and retiring president of the association, pointed out that steel warehouse distributors are maintaining second rank as an outlet for finished steel products, surpassed only by the automotive industry.

Citing statistics compiled by STEEL, Mr. Rogers said warehouse steel sales reached an all-time peak in 1937, the 4,342,000 gross tons sold exceeding the previous high of 1936 by 234,000 tons. This is 352,000 tons above the pre-depression peak of 1929, when total steel production was considerably higher.

Of total output last year, warehouses distributed 13.28 per cent, almost one-seventh, surpassing the railroad and building industries.

President Rogers reported association membership has increased steadily and now includes 320 warehouse members and, with few exceptions, the leading steel producers.

Reviewing the past year's work, Mr. Rogers said the turn in business conditions has resulted in delay of certain reforms in selling and handling steel until further recovery.

Defines Mill, Jobber Functions

He concluded: "We must diligently protect and increase our participation in the business arising from markets that can best be served by steel warehouses. Not only must we maintain and enhance our relationships with our own customers, but we must constantly increase our service to them, and to our sources of supply as well, by keeping abreast of developments of new steels and new markets for them. In other words, we must serve our customers with ideas as well as with steels."

To clarify respective functions of mills and warehouses, Mr. Doxsey urged the following for consideration of warehouse distributors and steel mills:

Thorough cost analyses by the mills to determine the added expense over and above mill base prices of handling less-carload orders and small items included in carload orders.

That these cost studies embrace the expense of stocking steel at the mills and at mill depots, cutting to specified size, wastage, maintenance of records and other factors incident to handling and servicing small item orders.

That item extras or other charges, commensurate with costs, be applied by the mills to all small item orders from all sources, whether shipped from mills or mill depots.

That the mill customers who place desirable specifications shall benefit in reasonable degree from such savings as may be effected by curtailment of gratuitous and below-cost servicing of small item orders.

That indiscriminate solicitation by the mills of small orders be discouraged as an unprofitable and an unwarranted sales and operating expense.

That the mills give all proper and

possible encouragement to warehouse distributors who handle exclusively the products of domestic mills.

That the handling by the warehouse of small less-carload items for direct shipment from the mill to the customer should be eliminated.

That the warehouses do not ask the mills to accept small item orders for warehouse stocks that they would not have the mills solicit for direct shipment to other customers.

That high standards in purchasing, as well as intelligent and consistent policies in selling, be adopted by steel distributors.

That the distributors constantly strive to give best possible service at the least possible cost.

Proposal to have two base prices apply on galvanized sheets as a possible solution to the confusion attending this business was suggested in the flat rolled committee's report, read by Fred S. Doran, Joseph T. Ryerson & Son Inc., Cleveland.

The committee stated that the two bases, if established by the mills, would be one base price to cover sheets 24-gage and heavier and another, perhaps considerably lower, on sheets that are manufactured primarily for roofing and siding. This new base would apply on sheets 26-gage and lighter.

"Advantage of this suggestion," the committee said, "seems to lie in the possibility of divorcing light sheets which, because of their use as roofing, tend to weaken the price structure of all gages produced. It might be possible to actually classify flat galvanized sheets lighter than 24-gage as unformed roofing, and . . . perhaps all sheets lighter than 24-gage might be sold by the square rather than by hundred weight."

The proposal is still in the formative stage. It has not been made to any mill and it is uncertain just how receptive the producers would be to such a system.

Uses Two Sales Methods

At present there are at least two different sales methods used by distributors in selling galvanized sheets, said Mr. Doran.

The policy of the warehouse receiving a functional discount as a jobber or an additional reduction in some lighter gages as a fabricator differs considerably from the average steel warehouse not enjoying a fabricators' discount. The latter looks to the sheet department to hold up its end in the general expense of doing business. As a class, the latter sellers avoid taking orders for future delivery, but the former type frequently sells for future shipment.

The jobber having the advantage of the functional and fabricator discount may combine roofing with flat sheets and ship either from stock or from his mill source. In the matter of extras, discounts and buying the sheet metal fabricator-distributor actually secures a lower price than other jobbers. Some use fabricating stock to fill warehouse orders.

"Perhaps the only improvement which the committee might claim to have seen in this industry in the last year or so can be found in the published extras of the mills today in which they restrict the application of quantity extras to flat galvanized sheets, without including roofing and siding," said Mr. Doran.

Lester Brion, president, Peter A. Frasse & Co., New York, stressed the value of authentic business data and statistics. More than half the association's members are now cooperating in compiling facts on current warehouse business, which in turn is cleared to members through association headquarters. Co-operative efforts also have been made to obtain comparative figures on costs of operating a steel warehouse business.

Intellectual dishonesty in the philosophy behind the Wagner labor relations act was charged by Fred I. Perkins, of McKeshon, Merrick, Arter & Stewart, New York, in a discussion of labor laws and industry. The labor act he termed a piece of admittedly class legislation "outrageous" in its bias.

Record Attendance Expected for Foundry Show and Convention

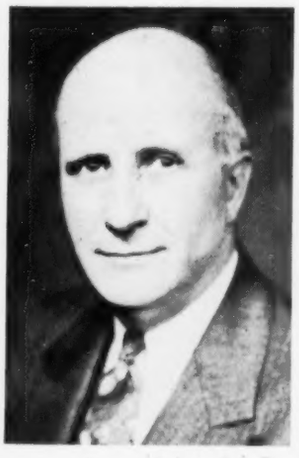
■ PREVIEW of the American Foundrymen 's association's annual exhibition, in Exhibition hall of Public auditorium, Cleveland, will be held for northern Ohio foundry employes, Saturday, May 14. Tickets will be distributed through foundries in the district. More than 200 exhibits of foundry equipment and supplies are expected to be in place.

The show and forty-second annual convention, first sessions of which will be held in the auditorium May 16, will close on Thursday, instead of Friday as in recent years. A record attendance is anticipated.

The convention program provides a wide variety of papers of interest in the steel, malleable, gray iron and nonferrous branches of the industry. Details were presented in STEEL, April 11, p. 78.

Convention entertainment features are being arranged by committees of the Northeastern Ohio chapter of the association with Bertram G. Parker, Youngstown Foundry & Machine Co., Youngstown, O., general chairman; Leroy P. Robinson, Werner G. Smith Co., Cleveland, general vice chairman; John H. Tressler, Hickman, Williams & Co., Cleveland, general secretary; and R. F. Lincoln, Osborn Mfg. Co., Cleveland, general treasurer.

The largest stag party in the association's history will be held in the auditorium and Music hall on the evening of May 17.



B. G. Parker

L. P. Robinson

R. F. Lincoln

J. H. Tressler

April Pig Iron Production Off 2.5 Per Cent; 11 Furnaces Down

■ APRIL production of coke pig iron suffered a mild setback with losses in total and average daily output, compared with March production. Furnace operations, however, were affected more severely, 11 stacks being blown out or banked to bring active units down to the lowest figure since late 1934.

Average daily production in April was 46,267 gross tons, a drop of 1159 tons, or 2.5 per cent, from the March daily rate of 47,426 tons. This was the smallest daily output for any month since December, 1934, with 33,161 tons, and the lowest April since 1933 when the rate was 20,786 tons. Daily output in April, 1937, was 113,354 tons.

Total output in April amounted to 1,388,008 gross tons, which, compared with the 1,470,211 tons made in March, represented a decrease of 82,203 tons, or 5.6 per cent. This total was the smallest since February with 1,306,333 tons, and presented the poorest April showing since 1933 when 623,606 tons was produced.

MONTHLY IRON PRODUCTION

Gross Tons

	1938	1937	1936
Jan.	1,444,862	3,219,741	2,029,304
Feb.	1,306,333	3,020,006	1,838,932
March	1,470,211	3,470,470	2,046,121
April	1,388,008	3,400,636	2,409,474
Tot. 4 mo.	5,609,414	13,110,853	8,323,831
May		3,545,180	2,659,643
June		3,115,302	2,596,528
July		3,501,359	2,595,791
Aug.		3,616,954	2,711,726
Sept.		3,417,960	2,728,257
Oct.		2,891,026	2,991,794
Nov.		2,007,031	2,949,942
Dec.		1,503,474	3,125,192
Total		36,709,139	30,682,704

Total production to date this year was 5,609,414 gross tons, a loss of 7,501,439 tons, or 57.2 per cent, compared with the 1937 four-month production of 13,110,853 tons.

Relating production to capacity, operations in April averaged 33.4 per cent, compared with 34.2 per cent in March, and 33.6 per cent in both February and January.

Active blast furnaces on April 30 totaled 79, a loss of 11 from the 90 operating at the close of March. The April total was the lowest since December, 1934, when 67 were operating and constituted the lowest April since 1933, with only 48 in blast. Total of 186 were in operation at end of April, 1937.

During April, 9 steelworks and 2 merchant stacks were blown out or banked with no stacks in either class resuming activity.

During April furnaces banked or blown out were: In Ohio: Youngstown No. 5, Republic Steel Corp.

AVERAGE DAILY PRODUCTION

Gross Tons

	1938	1937	1936	1935
Jan.	46,608	103,863	65,461	47,692
Feb.	46,655	107,857	63,411	57,675
March	47,426	111,951	66,004	57,120
April	46,267	113,354	80,316	55,719
May		114,360	85,795	55,986
June		103,843	86,551	51,949
July		112,947	83,735	49,043
Aug.		116,676	87,475	56,767
Sept.		113,932	90,942	59,009
Oct.		93,259	96,509	63,818
Nov.		66,901	98,331	68,876
Dec.		48,499	100,813	68,242
Ave.	46,745	100,573	83,832	57,694

In Pennsylvania: Two Duquesne, Edgar Thomson H and J, Carnegie-Illinois Steel Corp.; Monongahela, National Tube Co. In New York: Niagara A, Tonawanda Iron Corp. In Alabama: Woodward No. 2, Woodward Iron Co.; City No. 2, Sloss-Sheffield Steel & Iron Co.; Ensley No. 2, Tennessee Coal, Iron & Railroad Co. In West Virginia: Riverside, Wheeling Steel Corp.

Canadian Steel Output Increased in March

■ Production of steel ingots and castings in Canada in March totaled 118,676 tons, compared with 98,980 tons in February. The daily average was 3828 tons, compared with 3535 tons in February and with 4036 tons in March, 1937. Pig iron production in March was 66,228 tons, compared with 61,447 tons in February. While the total was greater the daily rate was 3 per cent below that of February. Ferroalloy output was 4031 tons in March against 4436 tons in February and 3868 tons in March, 1937.

For three months steel ingot and castings totaled 330,036 tons, compared with 352,164 tons last year. First quarter pig iron output was 202,537 tons, compared with 199,381 tons in the same period of 1937.

APRIL IRON PRODUCTION

	No. in blast last day of April	No. in blast last day of March	Total tonnage Merchant	Total tonnage Nonmerchant
Ohio	18	19	46,236	234,792
Penna.	23	28	25,041*	372,231*
Alabama	9	12	90,842*	79,799*
Illinois	6	6	67,606	57,688
New York	5	6	23,345	69,041
Colorado	1	1		
Indiana	7	7	170	227,195
Maryland	4	4		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	249	93,773
West Va.	1	2		
Michigan	2	2		
Minnesota	1	1		
Missouri	0	0		
Total	79	90	253,489*	1,134,519*

*Includes ferro and spiegeleisen.

Germany To Build 32 Blast Furnaces

■ FIGURES now are being taken on 32 blast furnaces for the three new steelworks being built in Germany to utilize low-grade ores in North Germany, Bavaria and Baden. These will use the new basic bessemer process developed at the Corby iron and steel plant in England. H. A. Brassert & Co., Chicago, through its Berlin branch, has the contract for the entire work. (STEEL, Aug. 9, 1937, p. 18.)

RATE OF OPERATION

(Relation of Production to Capacity)

	1938[1]	1937[2]	1936[3]	1935[4]
Jan.	33.6	76.6	48.2	34.2
Feb.	33.6	79.5	46.4	41.4
March	34.2	82.5	48.5	41.0
April	33.4	83.7	59.1	40.0
May		84.3	63.1	40.2
June		76.6	63.6	37.2
July		82.9	61.5	35.2
Aug.		85.7	64.3	40.7
Sept.		83.7	66.9	42.5
Oct.		68.4	71.0	45.8
Nov.		49.3	72.3	49.5
Dec.		35.6	74.2	49.0

[1] Based on capacity of 50,606,400 gross tons, Dec. 31, 1937; [2] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [3] capacity of 49,777,893 tons, Dec. 31, 1935; [4] capacity of 50,845,741 tons, Dec. 31, 1934. Capacities by American Iron and Steel Institute.

The Brassert company also is consulting engineer for a steel plant in New Zealand, to include mills and blast furnaces to cost about $25,000,000. A 43-inch hot and cold strip mill for Tata Iron & Steel Co., Jamshedpur, India, (STEEL, March 29, 1937) is another project under the Brassert organization, as are a continuous rod and merchant mill at Angora, Turkey, (STEEL, Jan. 4, 1937) and several mills for Stewarts & Lloyds, England.

■ United Shipyards Inc. stockholders will meet May 25 in New York to consider the agreement reached between company officials and the Bethlehem Steel Corp. for purchase of the company's shipyards by Bethlehem for $9,320,000.

April Steel Ingots Down 4.3 Per Cent

■ PRODUCTION of steel ingots in April amounted to 1,925,166 gross tons, representing 33.44 per cent of capacity, compared with 2,011,840 tons, at 33.84 per cent of capacity in March, a decline of 4.3 per cent, according to the American Iron and Steel institute. In April, 1937, production was 5,070,445 tons at 90.24 per cent, last month showing a shrinkage of 62 per cent from that figure.

Though falling behind March the April total was larger than December last year and January and February this year.

For four months this year production totaled 7,372,517 tons, a weekly average of 429,884 tons. In the corresponding months of 1937 the total was 19,425,414 tons, a weekly average of 1,132,683 tons.

Resign in Mass from SWOC, Reopen Apollo

■ Apollo Steel Co., Apollo, Pa., reopened last week after a majority of employes organized an independent union, elected officers, negotiated a four-month contract with the management.

The action resulted from a stalemate between the company and the Steel Workers Organizing committee which kept the plant closed since April 1. When SWOC's contract expired, A. M. Oppenheimer, president declared the company was unable to operate profitably unless a 3 to 5 per cent wage reduction was accepted. SWOC refused.

The workers, anxious to return to their jobs, circulated two petitions. One was a mass resignation from SWOC; the other was power of attorney giving a committee the right to bargain collectively. More than 700 of the 1001 normally employed were reported to have signed both. SWOC protested, but members went to work with the independent union.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended May 7	Change	Same week 1937	Same week 1936
Pittsburgh	25	— 1	93	62
Chicago	32.5	— 1	83	71
Eastern Pa.	27.5	None	73.5	44.5
Youngstown	30	+ 1	83	76
Wheeling	41	— 5	94	92
Cleveland	28	— 4	79.5	75.5
Buffalo	28	None	92	73
Birmingham	66	None	83	69
New England	30	+ 3	90	78
Cincinnati	40	+10	94	84
St. Louis	36.3	None	94	†
Detroit	18	None	100	94
Average	31	— 1	91	68.5

†Not reported.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	1,632,275	30.24	99,991	18.27	1,732,266	29.14	391,031	4.43
Feb.	1,577.752	32.37	125,493	25.40	1,703,245	31.73	425,811	4.00
March	1.854,103	34.35	157,737	28.83	2,011,840	33.84	454,140	4.43
April	1,793,522	34.31	131,644	24.84	1,925,166	33.44	448,757	4.29
4 mos.	6,857,652	.....	514,865	.....	7,372,517	.....	429,884	17.15
1937								
Jan.	4,433,145	84.20	291,749	54.29	4,724,894	81.43	1,066,567	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March	4,812,879	91.42	403,364	75.06	5,216,243	89.90	1,177,481	4.43
April	4,681,677	91.83	388,768	74.70	5,070,445	90.24	1,181,922	4.29
4 mos.	18,009,864	.....	1,415,550	.....	19,425,414	.....	1,132,683	17.15
May	4,767,269	90.55	382,582	71.19	5,149,851	88.76	1,162,495	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	335,440	62.56	4,556,001	78.48	1,030,769	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	268,433	51.70	4,298,354	76.46	1,004,288	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
Dec.	1,385,406	26.29	86,835	16.20	1,472,241	25.36	333,086	4.42
Total	46,057,921	74.21	3,449,845	54.54	49,507,766	72.39	949,516	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ MINOR changes in steelworks operating schedules dropped the national rate last week 1 point to 31 per cent. In a number of centers indications for this week are for a lower level of activity.

Youngstown, O.—Advanced 1 point to 30 per cent. This week the level depends on decision by Republic Steel Corp. as to operating its bessemer plant.

Detroit—Steady at 18 per cent, four open-hearth furnaces being in operation. Ford 10-inch and 14-inch mills went down Friday. The 12-inch mill will run another week and the sheet mills a little longer, after which all rolling schedules will be suspended.

St. Louis—Steady at 36.3 per cent for the fourth consecutive week.

Chicago—Declined 1 point to 32½ per cent, with blast furnace schedules unchanged.

New England—Increased 3 points to 30 per cent. The same rate is expected to continue this week.

Buffalo—Steady at 28 per cent.

Central eastern seaboard — Continued at 27.5 per cent. A slight reduction is scheduled this week as one interest will take off an open hearth.

Pittsburgh — Reduced operations by leading producers caused a loss of 1 point to 25 per cent.

Wheeling—Down 5 points to 41 per cent.

Cincinnati — Advanced 10 points to 40 per cent. A lower rate is indicated for this week.

Cleveland — Lost 4 points to 28 per cent. This week the rate is expected to go still lower as one producer takes off open hearths.

Birmingham, Ala.—Steady at 66 per cent.

Auto Production Gains

■ Automobile output for the week ended May 7 advanced 2630 to 53,385, according to *Ward's Reports*. Comparisons:

	Week-ended May 7	April 30
General Motors	23,385	14,670
Chrysler	11,400	13,050
Ford	11,885	15,785
All others	6,815	7,250

Monthly and yearly comparisons will be found on page 30.

■ Modern steel bungalows will attract attention to the "business appeal for Christianity," sponsored by the Christian Business Men's committee at the Golden Gate exposition in San Francisco in 1939.

1937 Production of Steel Ingots, Castings, and Various

All Figures in Gross Tons

ANNUAL STEEL PRODUCTION (Ingots and Steel for Castings)

Years	Open hearth			Bessemer	Crucible	Electric	Total
	Basic	Acid	Total				
1923	34,665,021	1,234,636	35,899,657	8,484,088	44,079	515,872	44,943,696
1924	30,719,523	857,827	31,577,350	5,899,590	22,473	432,526	37,931,939
1925	37,087,342	947,146	38,034,488	6,723,962	19,562	615,512	45,393,524
1926	39,653,315	1,038,664	40,691,979	6,934,568	15,493	651,723	48,293,763
1927	37,144,268	924,067	38,068,335	6,191,727	9,036	666,087	44,935,185
1928	43,200,483	913,473	44,113,956	6,620,195	7,769	802,260	51,544,180
1929	47,232,419	1,120,469	48,352,888	7,122,509	6,645	951,431	56,433,473
1930	34,268,316	780,856	35,049,172	5,035,459	2,253	612,599	40,699,483
1931	22,130,398	379,168	22,509,566	3,023,446	1,547	410,942	25,945,501
1932	11,742,682	164,648	11,907,330	1,532,076	645	241,111	13,681,162
1933	20,057,146	324,526	20,381,672	2,428,791	681	421,203	23,232,347
*1934	23,256,417	274,688	23,531,105	2,162,357	531	361,296	26,055,289
*1935	30,361,237	354,192	30,715,429	2,835,031	642	541,492	34,092,594
*1936	43,114,826	421,302	43,536,128	3,458,457	816	772,455	47,767,856
*1937	45,772,510	499,793	46,272,303	3,449,927	934	845,537	50,568,701

ANNUAL STEEL INGOT PRODUCTION

Years	Open hearth			Bessemer	Crucible	Electric	Total
	Basic	Acid	Total				
1923	34,093,711	653,337	34,747,048	8,416,576	42,127	279,914	43,485,665
1924	30,263,005	454,926	30,717,931	5,846,153	21,096	225,977	36,811,157
1925	36,632,060	484,843	37,116,903	6,670,128	17,729	335,978	44,140,738
1926	39,172,688	533,285	39,705,973	6,891,502	13,452	325,278	46,936,205
1927	36,750,387	493,653	37,244,040	6,153,703	7,696	371,278	43,776,717
1928	42,818,557	454,883	43,273,440	6,591,745	6,516	453,692	50,325,393
1929	46,644,206	576,393	47,220,599	7,091,680	5,762	532,392	54,850,433
1930	33,898,518	367,181	34,265,699	5,020,588	1,563	307,418	39,595,268
1931	21,986,933	194,388	22,181,321	3,011,394	831	235,376	25,428,922
1932	11,689,495	104,794	11,794,289	1,528,544	241	141,328	13,464,402
1933	19,972,805	195,495	20,168,300	2,425,779	399	299,808	22,894,286
1934	23,235,688	201,073	23,436,761	2,162,357	531	349,095	25,948,744
1935	30,334,442	248,512	30,582,954	2,835,031	642	521,818	33,940,445
1936	43,070,917	278,406	43,349,323	3,458,457	816	704,213	47,512,809
1937	45,719,507	333,473	46,052,980	3,449,927	934	814,310	50,318,151

PRODUCTION OF DUPLEX STEEL

Years	Gross tons	Years	Gross tons	Years	Gross tons
1923	2,919,286	1928	2,232,197	1933	386,154
1924	2,131,856	1929	2,961,292	1934	591,373
1925	2,797,318	1930	2,045,277	1935	960,020
1926	2,815,980	1931	945,844	1936	2,099,102
1927	2,184,674	1932	289,263	1937	2,907,890

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS

Years	Ingots	Castings	Total	Years	Ingots	Castings	Total
1922	1,614,392	59,104	1,673,496	1930	2,317,183	126,128	2,443,311
1923	2,014,269	92,220	2,106,489	1931	1,366,010	89,903	1,455,913
1924	1,940,461	85,948	2,026,409	1932	757,560	41,044	798,604
1925	2,320,390	112,583	2,432,973	1933	1,475,400	71,783	1,547,183
1926	2,317,313	146,101	2,463,414	*1934	1,595,544	16,731	1,612,275
1927	2,385,904	145,844	2,531,748	*1935	2,087,427	32,231	2,119,658
1928	3,045,225	169,684	3,214,909	*1936	2,788,100	95,522	2,883,622
1929	3,764,287	192,920	3,957,207	*1937	2,975,598	57,028	3,032,626

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS BY PROCESSES

Processes	*1934	*1935	*1936	*1937
Open hearth steel—basic	1,278,343	1,633,541	2,239,885	2,285,000
Open hearth steel—acid	34,540	73,400	115,766	146,835
Bessemer steel	53	.....	.....	.....
Crucible steel	103	154	209	241
Electric steel	299,236	412,563	527,762	600,550
Total	1,612,275	2,119,658	2,883,622	3,032,626

*The figures for 1934, 1935, 1936 and 1937 include only that portion of the steel for castings which was produced in foundries operated by companies producing steel ingots.

PRODUCTION OF TIN AND TERNE PLATE AND LONG TERNE SHEETS

Years	Tin plate	Iron and steel terne plate and long terne sheets			Grand total
		Terne plate	Long terne sheets	Total	
1923	1,414,404	44,795	47,663	92,458	1,506,862
1924	1,328,228	42,217	48,209	90,426	1,418,654
1925	1,544,007	40,654	73,134	113,788	1,657,795
1926	1,674,322	39,922	68,062	107,984	1,782,306
1927	1,583,383	37,043	68,023	105,066	1,688,449
1928	1,714,990	33,578	90,637	124,215	1,839,205
1929	1,816,223	38,842	113,215	152,057	1,968,280
1930	1,660,325	20,585	82,533	103,118	1,763,443
1931	1,392,227	15,581	51,135	66,716	1,458,943
1932	986,217	10,882	35,408	46,290	1,032,507
1933	1,685,826	18,969	64,303	83,272	1,769,098
1934	1,502,918	32,983	67,328	100,311	1,603,229
1935	1,695,159	87,841	103,439	191,280	1,886,439
1936	2,103,153	127,056	125,352	252,408	2,355,561
1937	2,418,190	144,295	124,643	268,938	2,687,128

PRODUCTION OF HOT ROLLED IRON AND STEEL PRODUCTS BY STATES

States	1933	1934	1935	1936	1937
Maine, Mass., Rhode Island, Conn.	175,506	158,559	198,790	246,916	230,902
New York	646,923	800,338	959,095	1,440,038	1,831,579
New Jersey	73,199	86,466	94,097	111,047	113,002
Pennsylvania	5,059,366	5,619,410	6,521,515	10,032,035	11,167,740
Delaware, Md., Va.	711,862	788,824	977,361	1,367,012	1,768,734
*West Virginia	779,914	797,039	1,045,051	1,191,403	1,125,382
Kentucky, Tenn., Ga., Texas	366,553	401,305	571,732	658,761	594,730
Alabama	567,819	628,409	728,390	1,097,414	1,268,175
Ohio	3,974,493	4,301,239	5,401,948	7,697,296	7,754,938
Indiana	1,984,423	2,446,052	3,276,717	4,431,090	4,896,446
Illinois	1,150,087	1,311,243	1,890,251	2,510,249	2,771,172
Michigan, Wis., Minn.	686,760	923,724	1,467,362	1,708,914	1,980,842
Missouri, Okla.	149,014	167,112	201,360	315,691	288,808
Colorado, Wash.	166,180	246,999	283,793	534,533	545,052
California, Canal Zone	242,987	292,787	347,090	468,980	428,887
Total	16,735,086	18,969,506	23,964,552	33,801,379	36,766,389

PRODUCTION OF HOT ROLLED IRON AND STEEL PRODUCTS IN 1937

	Gross tons
FLAT ROLLED PRODUCTS:	
Plates (sheared and universal)	3,243,248
Sheets	7,839,506
Strip	2,895,561
Hoops	102,932
Cotton ties and baling bands	62,515
Black plate	2,954,086
Total	17,097,848
BARS:	
Merchant	5,186,704
Concrete reinforcement	844,557
Total Bars	6,031,261
Structural shapes	3,276,846
Sheet piling	116,418
Rails	1,445,739
Long splice bars, tie plate bars, etc.	450,925
Skelp	2,279,862
Blanks or pierced billets for seamless tubes	1,921,883
Wire rods	3,009,290
Car wheels (rolled steel)	161,080
Cross ties	14,484
Rolled forging blooms, billets and axle blanks	667,342
Blooms, billets, slabs and sheet bars for export	216,887
All other finished hot rolled products	76,524
Total	13,637,280
Grand total	36,766,389

Forms of Finished Products Announced by Steel Institute

All Figures in Gross Tons

PRODUCTION OF FLAT ROLLED PRODUCTS BY CLASSES

	1933	1934	1935	1936	1937
PLATES:					
Universal	311,747	534,784	439,362	676,799	836,226
Sheared	848,635	902,995	1,015,983	1,849,942	2,407,022
Total	1,160,382	1,437,779	1,455,345	2,526,741	3,243,248
SHEETS:					
Hot rolled	727,442	1,036,244	1,555,034	2,734,760	3,865,071
Hot rol. ann.	2,364,968	2,166,361	3,620,523	4,261,145	3,974,435
Strip	1,830,106	2,196,840	2,647,589	3,224,916	2,895,561
Hoops	48,344	48,808	89,852	109,279	102,932
Cotton ties & baling bands	51,081	28,300	24,719	37,781	62,515
Total	5,021,941	5,476,553	7,937,717	10,367,881	10,900,514
BLACK PLATE:					
For tinning	1,676,701	1,499,877	1,794,718	2,283,378	2,610,385
All other	287,157	235,554	265,516	346,293	343,701
Total	1,963,858	1,735,431	2,060,234	2,629,671	2,954,086
Grand total	8,146,181	8,649,763	11,453,296	15,524,293	17,097,848

PRODUCTION OF PLATES, SHEETS AND STRIP BY SIZES

	1934	1935	1936	1937
UNIVERSAL PLATES:				
6 ⅛" to 48" wide—¼" & thicker	476,430	385,326	601,134	749,791
48 ⅛" & wider—0.1875" & thicker	58,354	54,036	75,665	86,435
Total	534,784	439,362	676,799	836,226
SHEARED PLATES:				
6 ⅛" to 48" wide—¼" & thicker	436,623	366,680	678,348	758,089
48 ⅛" & wider—0.1875" & thicker	466,372	649,303	1,171,594	1,648,933
Total	902,995	1,015,983	1,849,942	2,407,022
BLACK SHEETS:				
Hot rolled—16 ga. & heavier (a)	1,036,244	1,555,034	2,734,760	3,865,071
Hot rolled ann.—17 ga. & lighter (b)	2,166,361	3,620,523	4,261,145	3,974,435
Total	3,202,605	5,175,557	6,995,905	7,839,506
STRIP (c):				
To and incl. 6" in width	672,997	852,856	1,003,472	920,477
Over 6" to and incl. 23 ⅝" in width	1,523,843	1,794,733	2,215,444	1,975,084
Total	2,196,840	2,647,589	3,224,916	2,895,561

(a) Hot rolled sheets—24" to 48" in width by 0.249" to 0.059" in thickness; 48 ⅛" and over in width by 0.1874" to 0.059" in thickness.

(b) Hot rolled annealed sheets—3½" and less in width by 0.024" and less in thickness; 3⅝" to 6" in width by 0.034" and less in thickness; 6⅛" to 23⅝" in width by 0.058" and less in thickness; 24" to 48" in width by 0.058" and less in thickness; 48 ⅛" and over in width by 0.058" and less in thickness.

(c) Hot rolled strip—flats 3½" and under in width by 0.249" to 0.025" in thickness; 3⅝" to 6" in width by 0.249" to 0.035" in thickness; 6⅛" to 23⅝" in width by 0.249" to 0.059" in thickness.

PRODUCTION OF IRON AND STEEL MERCHANT BARS

Years	Total	Years	Total
1928	6,277,835	1933	2,284,776
1929	6,459,896	*1934	2,802,427
1930	4,131,973	*1935	3,699,057
1931	2,440,363	*1936	5,062,948
1932	1,313,896	*1937	5,186,704

*Includes bolt, nut and rivet, spike and chain, toe calk, horseshoe, finger, staybolt and all other miscellaneous bars which in 1933 and prior years were included in "all other" miscellaneous hot rolled products.

PRODUCTION OF IRON AND STEEL CONCRETE REINFORCEMENT BARS

Years	Rolled from new steel	Rolled from old material	Total
1928	*	*	951,888
1929	*	*	963,600
1930	682,681	167,470	850,151
1931	500,055	143,578	643,633
1932	275,115	110,490	385,605
1933	294,349	75,924	370,273
1934	383,627	103,377	487,004
1935	405,313	152,047	557,360
1936	820,523	208,040	1,028,563
1937	677,256	167,301	844,557

*Data not available.

PRODUCTION OF HEAVY AND LIGHT STRUCTURAL SHAPES

Years	Heavy shapes	Light shapes	Total	Years	Heavy shapes	Light shapes	Total
1928	3,408,545	687,598	4,096,143	1933	853,914	255,543	1,109,457
1929	4,055,615	722,405	4,778,020	1934	1,131,133	293,907	1,425,040
1930	3,010,847	501,626	3,512,473	1935	1,303,613	446,127	1,749,740
1931	1,768,374	294,484	2,062,858	1936	2,216,319	681,312	2,897,631
1932	782,570	154,658	937,228	1937	2,546,582	730,264	3,276,846

PRODUCTION OF SKELP, AND BLANKS OR PIERCED BILLETS FOR SEAMLESS TUBES

Years	Skelp (a)	Blanks or pierced billets
1928	3,368,973	1,190,658
1929	3,517,238	1,382,171
1930	2,682,046	1,248,156
1931	1,499,280	732,569
1932	607,599	370,270
1933	994,515	588,998
1934	1,120,217	824,542
1935	1,352,079	953,371
1936	2,156,602	1,615,963
1937	2,279,862	1,921,883

(a) Includes Iron and Steel.

PRODUCTION OF SEAMLESS, LAP-WELD, BUTT-WELD, AND ELECTRIC-WELD PIPE AND TUBES IN 1937

SEAMLESS PIPE AND TUBES*

	Standard pipe	Line pipe	Oil country goods	Boiler tubes	Mechanical tubes	Miscellaneous	Total
Hot finished†	43,312	388,148	963,181	117,767	88,186	25,758	1,626,352
Cold drawn	3,335	1,297	1,756	31,007	92,705	434	130,534
Total	46,647	389,445	964,937	148,774	180,891	26,192	1,756,886

LAP-WELD, BUTT-WELD AND ELECTIC-WELD PIPE AND TUBES*

Lap-weld and Butt-weld¶	1,257,032	205,474	152,083	16,622	.....	33,027	1,664,238
Electric-weld¶	66,093	66,648	149,568	.....	59,123	61,180	402,612
Total	1,323,125	272,122	301,651	16,622	59,123	94,207	2,066,850

*Production of black pipe, including stainless steel pipe and black pipe subsequently galvanized, sherardized, or enameled.

†Does not include hot finished tubes subsequently cold drawn.

¶Includes Iron and Steel.

Johnson Decries "Maze of Conflict"

■ BLAME for the current depression and unemployment was placed squarely on the national administration's uncertain and inconsistent policies by Gen. Hugh S. Johnson in speaking before the Concrete Reinforcing Steel institute at Hot Springs, Va., last week.

"Government is trying to operate at one and the same time the capitalist and profits system, and some form of modified socialism. It can't be done," he declared.

"It is like a man mounting a horse and attempting to gallop furiously in all directions at the same time."

The administration, he said, "decries high prices as a pinch on workers' buying power and in the same breath advocates every known inflationary policy to make prices high in the very manner most certainly designed to destroy workers' buying power.

"It wants a wages and hours bill to stabilize workers' income—but it insists on exempting the very class of workers who are most in need of such government intervention—farm workers.

"It insists in industry on low prices regardless of losses and decentralization of control, yet in agriculture is using every device of centralization and higher price that imagination or ingenuity can conceive. . . .

Policy Inconsistent

"It belabors business to expand employment and new industries, and insists on tax policies that make any such expansion stark physical impossibilities."

These inconsistencies, he said, are the cause for the depression and the threat of continued misery and unemployment.

"There is every evidence that daily the people are becoming more aware of this and that congress is reflecting their awakening. When enough people awaken, we need have no fear. Congress, after all, is merely a mirror reflecting the popular will and so, with a little greater lag, is the Chief Executive.

"Congress has begun to function again. It seems determined to restrict Mr. Roosevelt to his office. With his retirement to the Presidency and an inevitable exodus of our amateur economic repair-men, our capitalist system will be permitted to work again and the depression will be over. From all present indications, it won't be long now."

Frank T. Sheets, president, Portland Cement association, in discussing the future of reinforced concrete, stressed the widening of the structural, housing and highway markets.

Kenneth D. Mann, executive vice president, Truscon Steel Co., Youngstown, O., was re-elected president of the institute. James F. Curley of the Concrete Steel Co., New York, and Albert C. Weihl of the Pollak Steel Co., Cincinnati, were re-elected vice presidents, and Mark Beeman, executive secretary.

New directors include George W. Connors Jr., Connors Steel Co., Birmingham, Ala.; H. P. Ladds, Sweets Steel Co., Williamsport, Pa.; John D. Roberts, Central Texas Iron Works, Waco, Tex.; Ralph T. Rowles, Jones & Laughlin Steel Corp, Pittsburgh; and S. V. Taylor, Concrete Steel Fireproofing Co., Detroit.

FINANCIAL

U. S. STEEL'S FUNDED DEBT STILL FAR BELOW 1929

■ ONE of the largest industrial financing operations since 1929 was announced last week, with the United States Steel Corp. deciding to file a registration statement covering a proposed issue of approximately $100,000,000 of 10-year debentures.

To be offered in June, and to be underwritten by a banking group headed by Morgan Stanley & Co., New York, the issue will provide for the retirement of the $50,000,000 bank loans made earlier in the year and funds for plant construction, working capital and general purposes. The Irvin works, now nearing completion, will be the principal beneficiary of such funds as will be set aside for plant construction.

Incidentally, the corporation at the end of the first quarter had an unexpended balance of approximately $56,000,000 on approved appropriations for improvements.

The action was considered in financial circles as indicating improvement in the money market, and special interest was attached to the fact that the proposal called for an open market loan, instead of an exchange of one security for another.

Preliminary to this program stockholders at their annual meeting April 4 authorized directors to issue bonds, debentures and other obligations convertible into common stock, and approval was given to change the common stock from $100 par to no par and to increase the authorized common stock from 12,500,000 shares to 15,000,000 shares.

While completion of the sale will raise the funded debt to the highest level since 1929, it will still leave the corporation with but approximately one-third of the direct funded debt carried in that year.

LABOR

NLRB MAY REOPEN STEEL CASES; INLAND APPEALS

■ NATIONAL labor relations board last week indicated it may rescind its order against Republic Steel Corp. and reopen the Republic, Ford and several other cases under modified procedure.

"Retreat" of the labor board followed a Supreme Court reprimand to Secretary of Agriculture Henry Wallace in the Kansas City stockyards case for accepting as his own the findings of a government prosecutor without allowing defendants a fair hearing, paralleling procedure of the labor board and its trial examiners.

The high bench decision had a remarkable effect on the board and J. Warren Madden, chairman, announced "withdrawal of pending court proceedings in a few cases" because "it believes that it will lead to elimination of unnecessary legal controversies."

However, the board was restrained by the federal circuit court of appeals at Philadelphia from "taking any steps or proceedings whatsoever" in its case against Republic, and was ordered to show cause by May 13 why it should not be required to produce in court the entire record of testimony.

This order prevents the board from withdrawing the Republic case or "patching up" the record before May 13.

Acts To Recall Ford Case

Action to recall its case against Ford Motor Co. was taken by the board in circuit court in Covington, Ky. Similar action was expected in several other cases in which defendants were denied a fair hearing, including, possibly, the Inland Steel Co. case.

Inland meanwhile filed in circuit court a petition for review and listed 43 reasons why the order should be set aside.

Various instances are cited which claim the hearing was unfair, inconsistent with the requirements of due process of law, and did not constitute such a hearing as the petitioner was entitled to under the act. It is claimed further the board's order is beyond the power conferred by the act and deprives the company of freedom of contract and liberty and property without due process of law.

Several findings of the board are charged with not having been supported by evidence at the hearing. Animosity and hostility on the part of the trial examiner toward the company, its attorneys and witnesses, and intimidation of witnesses also are charged.

MEN OF INDUSTRY

■ O. L. PRINGLE, general manager of operations, Columbia Steel Co., San Francisco, subsidiary of United States Steel Corp., has been elected vice president in charge of operations. Mr. Pringle has been associated with the iron and steel and kindred industries 35 years, beginning as a test boy with the former Carnegie Steel Co. In 1934 he went to San Francisco from the St. Louis Gas & Coke Co. and became assistant to the president of Columbia Steel. He was elevated to general manager of operations in 1936.

O. L. Pringle

♦

K. R. Burke, general superintendent, Koppers Co., Pittsburgh, tar and chemical division, has been elected a vice president.

♦

Oliver C. Henkel has been elected treasurer, Empire Sheet & Tin Plate Co., Mansfield, O., to succeed his father C. H. Henkel, former vice president and treasurer, who asked to be relieved of his duties.

♦

Frank H. Carter has been appointed purchasing agent for the Maryland Dry Dock Co. Inc., Curtis Bay, Baltimore. He formerly was purchasing agent for Dietrich Bros., Baltimore.

♦

Howard W. Beatty, associated with the Inland Steel Co., Chicago, the past 16 years, and since 1933 in the rail steel and reinforcing bar division of the sales department, has been appointed assistant manager of sales for rail steel and reinforcing bars.

♦

J. B. Tytus has been elected vice president in charge of operations, and Frank H. Fanning, assistant vice president in charge of operations, American Rolling Mill Co., Middletown, O. Mr. Tytus joined Armco in 1904 and Mr. Fanning in 1909. Mr. Tytus was awarded the Gary medal by the American Iron and Steel institute several years ago for his part in the development of the continuous rolling process in the manufacture of iron and steel sheets. He was named vice president in charge of processing developments in 1927. Mr. Fanning was associated with Mr. Tytus in 1912 during the early days of East Works Armco mill at Middletown. He later served on numerous special assignments, and became assistant to executive vice president in 1933.

J. B. Tytus

♦

Robert H. Haley, division freight agent, American Steel & Wire Co., Worcester, Mass., has been appointed traffic manager of all United States Steel Corp. subsidiaries in New England. He has been associated with the Wire company since 1903.

♦

D. E. Batesole, assistant chief engineer, Norma-Hoffmann Bearings Corp., Stamford, Conn., has been promoted to chief engineer, succeeding the late George R. Bott. T. E. Rounds of the engineering department, has been made assistant chief engineer.

♦

Milton P. Higgins, associated with the Norton Co., Worcester, Mass., about ten years, more recently as manager of sales research, has been named resident manager of the company's Chippawa, Ont., electric furnace plant. He succeeds the late John B. Glaze.

♦

C. C. Abbott, who recently resigned as district sales manager in Philadelphia for Eastern Rolling Mill Co., has established an agency in Dayton, O., at 812 U. B. building. He is sales representative in the Dayton district for the Newport Rolling Mill Co., Newport, Ky.

♦

Lothair Teetor, since 1932 vice president, Perfect Circle Co., Hagerstown, Ind., has been elected president and general manager, succeeding his father the late C. N. Teetor. Ralph R. Teetor has been elected vice president and head of the engineering division.

♦

Dr. J. S. Reid, Cleveland, president of Standard Products Co., Port Clinton, O., has taken over active management of the plant. He succeeds George Duffy, resigned. H. B. Knerr has been named office manager in addition to serving as assistant treasurer.

♦

S. C. Du Tot, formerly district manager at Chicago for the Electro Metallurgical Sales Corp., has been named district sales manager at Pittsburgh, with headquarters in the Oliver building. W. E. Remmers, of the Chicago sales office, will succeed Mr. Du Tot.

♦

Raymond D. Copeland has been appointed purchasing agent in the Pittsburgh district for Bethlehem Steel Co., Bethlehem, Pa. He succeeds R. W. Gambs, transferred to Chicago as purchasing agent. Mr. Copeland formerly was assistant purchasing agent at Pittsburgh.

♦

Louis Baum, for the past 20 years New York district sales manager for Truscon Steel Co., has organized his own company, the Seaboard Steel Products Corp., with offices at 205 East Forty-second street, New York, and will engage in the distribution of steel building products. He is president of the new company.

♦

T. L. Strimple, National Acme Co., Cleveland, has been elected president, National Screw Machine Products association. Other officers include: Vice president, John Higgins, Whitet-

Frank H. Fanning

J. L. Hull

Higgins Co., Providence, R. I.; treasurer, A. C. May, Peerless Automatic Machine Co., Cleveland, and secretary, O. B. Werntz, Cleveland.

♦

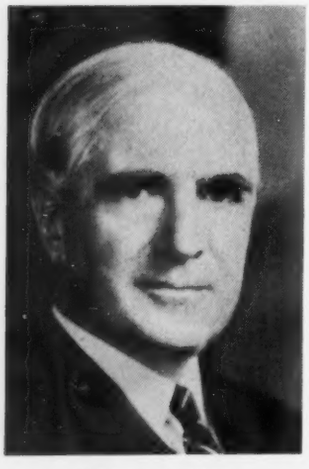
Walter G. Helber, general superintendent of the Racine, Wis., branch factory of Nash Motors Co., Kenosha, Wis., division of Nash-Kelvinator Corp., has resigned after 14 years of service. He is succeeded by William Riegg, an engineering and production executive of Nash Motors since 1916.

♦

George A. Bahm, assistant superintendent, United Engineering & Foundry Co., Youngstown, O., has resigned to become superintendent of shops, Youngstown Sheet & Tube Co., Youngstown. Rowland E. Williams, foreman of No. 1 shop at Youngstown for the United company, succeeds Mr. Bahm, and Leonard Round, associated with United since 1910, succeeds Mr. Williams.

♦

William Arthur has been named Philadelphia district office manager of Allis-Chalmers Mfg. Co., to succeed the late J. E. Wray. Mr. Arthur, widely known for his engineering contributions to electric traction, since 1931 had been the company's special representative for railway traction and mercury arc rectifiers in the East. Prior to his association with Allis-Chalmers he was manager, traction department, and assistant to the vice president, American Brown Boveri Electric Corp. until its electrical activities were absorbed by Allis-Chalmers.



William Arthur

♦

J. L. Hull, since 1928 assistant works auditor, South Chicago works, Carnegie-Illinois Steel Corp., has been made works auditor, succeeding H. S. Sylvester who has been named general works auditor. Mr. Hull has been associated with the company since 1904. W. J. Young, since 1935 assistant works auditor, assumes Mr. Hull's former duties. He has been with Carnegie-Illinois since 1910. H. P. Sargent has also been appointed as assistant works auditor.

♦

Myron C. Taylor, who recently retired as chairman of the board, United States Steel Corp., has been named by President Roosevelt to serve as American representative on the international committee for refugees, which will seek to aid Austrians and Germans exiled from their countries. Mr. Taylor left recently for a holiday in Europe, where he will spend much of his time at his villa in Florence.

♦

J. J. McDermott and C. A. Donley have been re-elected president and general manager, and secretary, respectively, Wrought Iron Co., Lebanon, Pa. R. S. Imboden has been elected treasurer, and Irving M. Martin has been appointed superintendent of mills, replacing V. F. Ache, resigned. Directors elected are: Mr. McDermott, C. P. Lineaweaver, J. Marechal Brown Jr., C. A. Ernst and Harry W. Harrison.

♦

J. C. Andrews, secretary of the credit committee of United States Steel Corp. subsidiary manufacturing companies, has retired after 46 years continuous service. He began in the engineering department of the former Carnegie Steel Co. in 1892. Upon formation of a credit committee by Carnegie in 1895 he became an assistant in the new department. He was named secretary of the manufacturing subsidiaries' committee in 1902.

♦

Charles E. O'Brien, Grabler Mfg. Co., Cleveland, has been elected president, Purchasing Agents' Association of Cleveland. Other officers are: First vice president, Vincent Cada, Eaton Mfg. Co.; second vice president, J. R. Keach, Ohio Rubber Co.; secretary, A. C. Mader, Bishop & Babcock Co. F. J. Meket, Aluminum Co. of America, retiring president,

W. J. Young

has been named national director, and Frank Chesney, American Steel & Wire Co., has been elected a trustee for a two-year term.

♦

Raoul E. Desvernine, member of the law firm of Miller, Owen, Otis & Bailly, New York, for 20 years, has been elected president, Crucible Steel Co. of America, New York. He succeeds F. B. Hufnagel, who upon the death of H. S. Wilkinson about a year ago became chairman, although continuing as president. Mr. Desvernine has been acting as counsel to the Crucible company for some time, and is a member of its board of directors. He has also represented other iron and steel firms, and is familiar with the general problems of the industry, especially in industrial relations.

♦

H. S. Sylvester, recently South Chicago works auditor of Carnegie-Illinois Steel Corp., has been made general works auditor in charge of works accounting, with offices in the comptroller's department at Pittsburgh. Mr. Sylvester has been associated with the South Chicago plant since 1900 when he began as a plate mill inspector. He served successively as chief shipper, chief clerk,

H. S. Sylvester

assistant works auditor, and works auditor.

♦

W. Roy Widdoes has been appointed general manager of By-Products Steel Corp., Coatesville, Pa. Born in Coatesville in January, 1895, Mr. Widdoes was educated at Coatesville high school, and joined Lukens Steel Co. in August, 1912, as a clerk in the time department. In July, 1915, he became associated with the Reading railroad, but returned to Lukens later in the same year, serving in the purchasing department. He was appointed assistant purchasing agent in 1929. In May, 1937, he joined the By-Products corporation as assistant to the president.

♦

Andrew H. Phelps has been elected general manager of purchases and traffic, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He succeeds T. J. Pace who has been

Andrew H. Phelps

appointed assistant to the vice president in charge of sales.

Mr. Phelps joined Westinghouse in January, 1937. For seven years he was sales manager and director of public relations, McGraw-Hill Publishing Co. Mr. Pace, associated with Westinghouse 36 years, has served successively as manager of the illuminating and rectifier section, manager of supply sales, director of sales and general manager of purchases and traffic.

♦

D. W. Prichard is devoting his time in the Chicago area to introducing a new line of heavy duty cleaners for the Pennsylvania Salt Mfg. Co. Mr. Prichard is a graduate chemist of Penn State college, and is experienced in laboratory and field work.

♦

Charles J. Muller, associated since 1925 with the geological department, Oliver Iron Mining Co., a United States Steel subsidiary, Duluth, has been transferred to the office of

W. Roy Widdoes

Thomas Moses, vice president, United States Steel Corp. of Delaware, who is in charge of raw materials. His first employment with the Steel corporation was as an inspector at the McDonald, O., plants of the former Carnegie Steel Co.

♦

George M. Mencke, formerly with Thomas Prosser & Sons and later with Carboloy Co., is now sales manager for the Vascoloy-Ramet Corp., North Chicago, Ill. Other additions to the company's sales engineering staff include: James A. Fraser assistant sales manager; A. M. Kebe, district manager, Cleveland territory; C. M. Grannis, district manager at Detroit; C. W. Blade, district sales manager, New England area; M. W. Dennis Jr., die sales engineer in the eastern territory, with headquarters at Pittsburgh; Walter J. Dennis, die sales engineer in the western territory, headquarters at Chicago, and S. A. Miniea, sales engineer in the Chicago district. Messrs. Fraser, Kebe, Grannis, Blade, and M. W. Dennis Jr. were formerly associated with Vanadium-Alloys Steel Co., while Walter J. Dennis previously was associated with the Illinois Tool Works.

D. W. Prichard

DIED:

■ WILLIAM H. SMITH, 65, metallurgist, production engineer and president of General Reduction Corp., in Detroit, May 2. In early years Mr. Smith was associated with John R. Lee in the Keim Mills, Buffalo, pressed steel fabricator. Later, with William S. Knudsen, he contracted to supply parts for Ford Motor Co., and in 1912 Ford acquired the Keim interests, Messrs. Smith and Knudsen going to Detroit. Mr. Smith remained with Ford until 1926, serving as engineering counsel. In recent years he had done considerable experimental work on a low-temperature reduction process for iron ore. From 1928 to 1932 he was research metallurgist for the University of Detroit.

♦

Charles H. Shaw, 40, for the past three years Philadelphia office manager, Worthington Pump & Machinery Corp., April 15. He had been associated with Worthington 18 years.

♦

Herbert L. Merrick, 65, founder and for 30 years president, Merrick Scale Mfg. Co., Passaic, N. J., in New York, May 2. He invented the Merrick Weightometer, a device for weighing commodities on a fast moving conveyor belt.

♦

Thomas N. Kurtz, 55, vice president, North American Refractories Co., April 21 in Pittsburgh. He was president of United States Refractories Corp., Mt. Union, Pa., until its merger with North American Refractories in 1930.

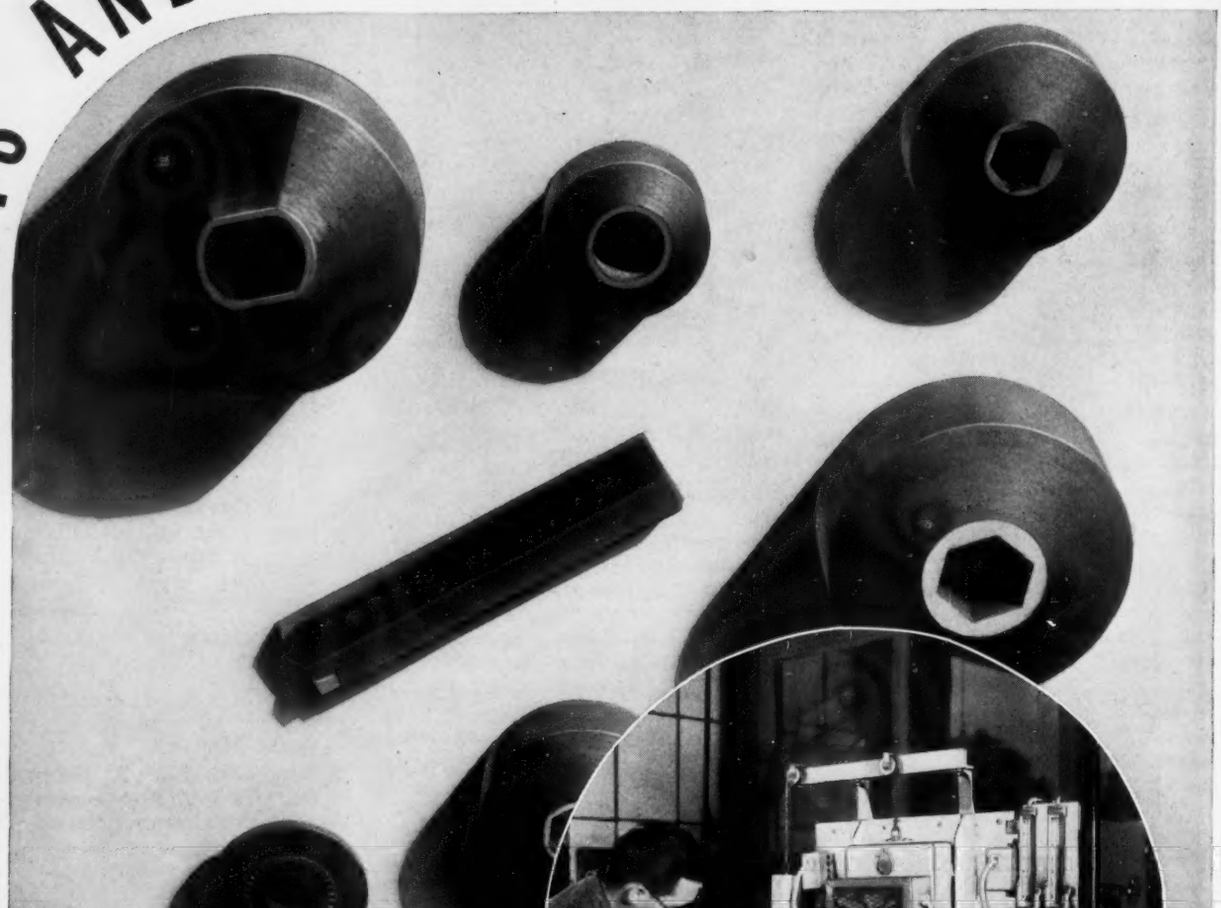
♦

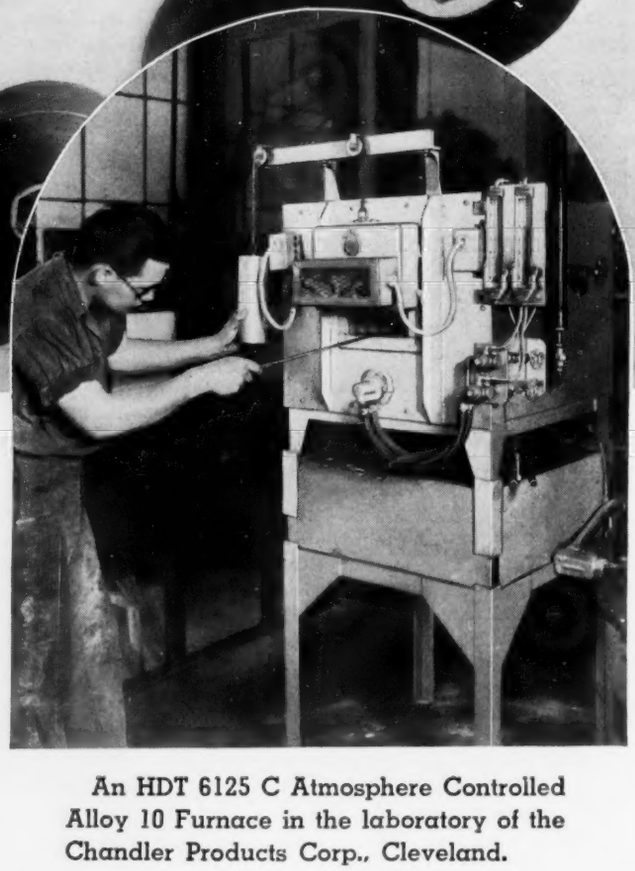
Alex R. Pribl, 57, widely known Saginaw, Mich., industrialist, in that city, April 14. A native of Austria, he came to this country when he was 21 and for a number of years was employed by Ford Motor Co., Penberthy Injector Co. and Bowen Products Co. He went to Saginaw in 1915 as general manager, Carde Stamping & Tool Co., and in 1917 became president and general manager, Saginaw Stamping & Tool Co.

♦

Frank Layman, 82, for many years prominent in the pig iron industry, at his winter home in Cocoanut Grove, Fla., April 26. Mr. Layman was vice president, Low Moor Iron Co., Low Moor, Va., from 1892 to 1920 and president from 1920 until the liquidation of the firm in 1932. After finishing his education at Ecole des Mines in Paris in 1880, he went to Virginia and engaged in mining ore, later building the Covington furnace and combining it with the Low Moor company.

CHANDLER PRODUCTS AND HEVI DUTY FURNACES





An HDT 6125 C Atmosphere Controlled Alloy 10 Furnace in the laboratory of the Chandler Products Corp., Cleveland.

For the hardening of high speed steel cutting tools and trimmer dies the Chandler Products Corporation use a Hevi Duty Alloy 10 Atmosphere Controlled Furnace. They have found the heat treating of their dies and tools in this furnace very satisfactory because of the precise, uniform and constant heat at the desired temperatures and the elimination of scale and decarburization.

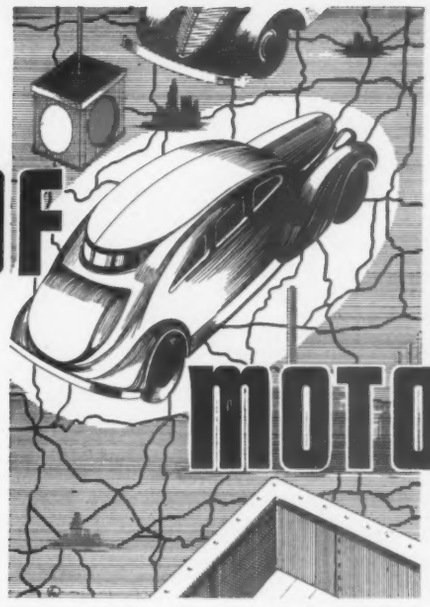
HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI DUTY ELECTRIC EXCLUSIVELY

TRADE MARK REGISTERED U. S. PAT. OFFICE

MILWAUKEE, WISCONSIN

MIRRORS OF MOTORDOM



DETROIT

■ MORTALITY among the once-great names of automobiles over the past 30 years has been high—one fairly recent compilation listing the names of over 1300 cars which at one time or another made a bow to the public and then returned to limbo. Only a score or so names continue on the roster of passenger cars, and even a few of these may have disappeared by the time 1939 models are unveiled.

Newcomers to the field have been scarce in the past decade, only American Bantam and Willys being included and the latter actually an outgrowth of the old Willys-Overland.

In view of the perils which confront the so-called independent producers it is easy to understand why even the most daring and aggressive of industrialists have steered clear of invading the automotive market, despite the visions of lush millions many can discern.

Crosley Plans 2-Cylinder Car

However, this situation may be changed shortly, if plans of the Crosley Radio interests mature. Crosley is a powerful figure in the radio industry, and has met with more than moderate success in the refrigerator field. Now the company is reported to have worked out designs for a new small car to sell for $250. It will be of all-steel construction, even including interior trim. The motor will be of the 2-cylinder opposed type, with guaranteed economy of 50 miles per gallon.

Is there an undeveloped market in this country for such form of transportation? Automobile men refer to the car as a "glorified motorcycle," but despite such aspersions there may be an untapped outlet for a car in this low-price class. There is little evidence either to support or deny such a belief, but a company with ample financial resources such as Crosley has might advantageously investigate this class of buyer to find out whether a small, low-power, low-speed and high-economy car would sell.

BY A. H. ALLEN
Detroit Editor, STEEL

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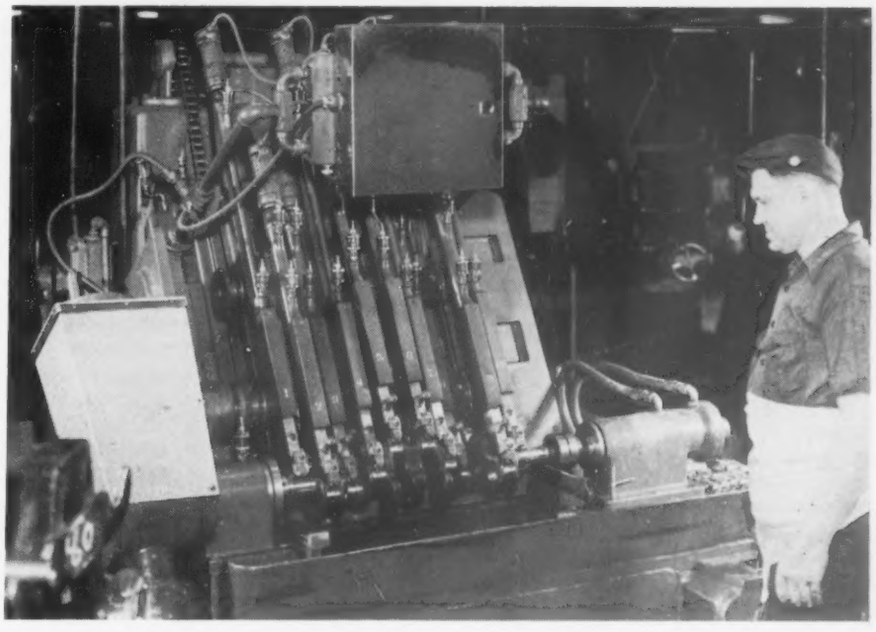
It is understood the tool costs on such a manufacturing project could be met by sale of 25,000 cars, or less than two weeks' output of Ford on the basis of present production.

A number of local parts and body interests have been called into the picture by Crosley, although it is not believed any decision to proceed has been reached. It is contemplated to build the car in the Crosley plant at Richmond, Ind.

Opinion of some students of the automobile market on its possibilities is, in brief, this: If the design can approximate what the public has become accustomed to in automobiles; if a moderate amount of pep and speed can be obtained in such a small motor; and if the program is backed by a smart, thorough and

Automatic Honing Gives Great Accuracy



■ **Plymouth crankshafts are automatically honed on this special unit built by Foster Machine Co., Elkhart, Ind. Surface produced by the hones is claimed to be "flawless within 0.000006-inch"**

distinctive merchandising program, mixed in with a little daring, then the Crosley will have at least a couple of years of profitable existence.

Pessimists will point to the failure of the Italian-built Fiat to meet with any great acceptance in this country. This can be explained from a number of angles. First, the price is too close to the small American cars; second, the Fiat suffers from an appearance standpoint; third, there has been no extensive or effective merchandising campaign; and fourth, it is a foreign product.

That another foreign builder is turning to the American market seems evident from the statement made last week by Emil E. C. Mathis, French auto tycoon, that he and Alex Wennergren, Swedish industrialist, were planning a new type of automobile with radial rear-mounted motor, designed to sell for less than $500. Tentative plans, he intimated, call for production in France, England, Sweden and in this country. He further stated the design provided economy of 50-60 miles per gallon and maximum speed of about 50 miles per hour.

■ CHANGE in finishing methods is calling for the installation of a considerable amount of new equipment at Dodge here. It has been proposed to change over from the present nitrocellulose lacquer finish to a synthetic enamel of the alkyd resin type, such as used now on Plymouth models and Dodge trucks.

By comparing certain features of the two processes, equipment needs can be inferred. The nitrocellulose lacquers dry by evaporation, are applied at 180 degrees Fahr., require four or five coats, with varying amounts of rubbing and polishing between coats. The alkyd resin type of finish dries by oxidation and polymerization, is applied at 260 degrees Fahr., requires only three coats, must be sprayed slower and only a minimum of rubbing, if any, is needed. The resin finish is believed to provide a more continuous film, but because rubbing is dispensed with, the final coat must be applied in an air-conditioned spray room from which all traces of dirt or contamination are excluded. Some saving in material cost is possible with the synthetic enamel, because of the relatively expensive solvent required to carry the lacquer pigment.

At present, General Motors and Chrysler lines, except Plymouth, use the lacquer finish, while Ford uses the synthetic enamel.

■ WILDCAT strikes again broke out last week in General Motors plants, this time at the Chevrolet parts plant in Bay City, Mich. Here is the plant manager's own account:

"A small group of men out of a working force of 1000 on the day shift staged a demonstration in the plant shortly after 7 a.m. by walking through the shop and shutting off machines in various departments.

"At 7:25 we told the men to go home. In the meantime, doors of employes' entrances had been locked on the inside with chains and padlocks by some of the employes. The office entrance had been chained and locked on the outside.

After the plant had been shut down by the strike, employes inside the main entrance finally unlocked the doors and allowed about 900 men who wanted to work but couldn't to leave. About 100 men remained in the plant.

"Chains and locks again were placed on the doors and later three foremen were attacked when they refused to leave the plant. At about 9:45 the foremen left."

The controversy originally involved only three men, but no effort was made to observe the grievance procedure provided in the agreement between the corporation and the UAW. Union officials later ordered the men out of the plant, but the damage was done, and Floyd O. Tanner, GM vice president, declared, "These repeated violations of the contract jeopardize seriously the future relationship between the UAW and the corporation."

GM officials have been further harassed by statements emanating from the county relief administrator at Flint purporting to reveal information from the corporation to the effect all plants there would be closed by July 1 and that all men with less than two years' seniority would be out of work. Mr. Sloan, GM chairman, took it upon himself to deny these reports, declaring that normal operations would be resumed in Flint as rapidly as business conditions warrant.

The relief administrator has been attempting to line up funds for transporting 12,000 families out of Flint, only stipulation being that the request for funds be voluntary and that there be no objections from the proposed destinations of the families.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	†238,753
3 mos.	1,116,997	1,302,108	669,369
April	527,625	553,231	*245,000
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated. †Revised.

Week ended	
April 9	60,975
April 16	62,021
April 23	60,563
April 30	50,755

(Production figures for the week ended May 7 will be found on page 21).

■ STEEL buying holds at a reduced level. Volume of actual orders is above the figure for last year at this time, although tonnage naturally is far below a year ago. Several important purchases of tool steel have been consummated in recent weeks, and there is also a little activity in pig iron, albeit present foundry demand does not indicate any feverish productivity on new body dies.

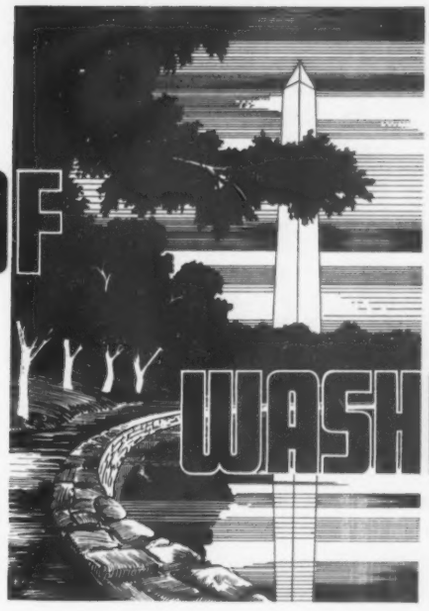
One of the large die shops in the city currently has 300 out of a normal force of 500 at work, chiefly as a result of Fisher Body requirements for 1939 models. But this company along with numerous others is keeping its fingers crossed on the labor situation, contracts between the UAW and tool and die shops now having expired. Negotiations are proceeding in the effort to draw up agreements which will satisfy the various unions with members in the tool and die trade, as well as the operators of these shops, but progress is slow.

Willys reports its new ½-ton trucks are accounting for about 20 per cent of the total unit volume of sales now; and further that most sales of both passenger cars and trucks come from areas outside large industrial centers.

First-quarter production of automobiles, according to department of commerce figures, totaled 669,369, a 49 per cent drop from the first three months of last year and a 40 per cent decline from the 1936 figure. April and May probably will account for about 240,000 each, and judging the balance of the year accordingly, the industry will be fortunate if the yearly total eclipses the 3,000,000 mark—and even this figure is half a million under pessimistic estimates peddled around here last fall.

■ General Electric Co. employes in 1937 received nearly $85,000 for new ideas submitted through the company's suggestion system. Almost 37,000 suggestions were made by workers, and more than 12,000 were adopted. During the past 11 years nearly $600,000 has been paid out to employes for new ideas adopted for use.

WINDOWS OF WASHINGTON



WASHINGTON

■ "DESPITE all that is said against business, I do not think business is discouraged," William S. Knudsen, president of General Motors Corp., told members of the Chamber of Commerce of the United States at the twenty-sixth annual meeting in Washington May 4.

"Business has to take the setback which comes with attempted centralization," he said, "and the advocates of bringing everything to one place must realize that while it is fine when everything is going strong, it is not so good when things are slack. We must keep our temper and try to work things out our own way. Industrial democracy must be preserved.

"Practically all of us in business or manufacturing started at the bottom, and the opportunity for everyone to advance according to merit is the last stronghold of industrial democracy. Whatever the rights of equity are, we will have to observe them.

Must Foster Old Virtues

"Discipline by consent is adherence to the ideal, the free opportunities for skill and energy to advance, and the one wish which today spurs us all on is the wish for more work, a large full-time self respecting job. There is no substitute for a man's job except another job. Unemployment insurance, old age pensions, work sharing programs, WPA jobs are all good palliatives, some needed permanently, some in emergency, none of them substitutes for a full-time honest job.

"We must foster the real American traits of independence in mind and spirit, pride in a job well done, and habits of thrift which cause a man to sacrifice to do his utmost to finance his future and that of his family."

Mr. Knudsen told the chamber that the industrial union in its present form has to depend on force in defiance of law.

"There are not many places in the United States," he said, "where laws can be enforced at the moment to control the movement. The technique of the sitdown strike is identical with that of syndicalists of Europe. France has finally had to take a stand against them because of their dangers as a political club rather than a social defensive weapon. I feel that the United States will eventually take the same stand officially."

More than a million American business men were represented at the chamber meeting. More than 2000 business men attended and major problems facing business were discussed. The industrialists were most interested in trying to find a way to combat the current depression and to promote national progress through the traditional American business system.

At the same time, the board of directors of the National Association of Manufacturers, of which Charles R. Hook, president of the American Rolling Mill Co. is president, suggested that "pump-priming to stimulate business cannot succeed unless it is accompanied by governmental policies that will permit business to accept priming and to go forward."

BY L. M. LAMM

Washington Editor, STEEL

MARITIME COMMISSION TO BUILD SHIPS FOR PACIFIC

Admiral E. S. Land, chairman of the United States maritime commission, sent a letter to Senator McAdoo, California, last week, telling of the determination of the commission to construct a minimum of 24 vessels at an estimated cost of between $90,000,000 and $100,000,000. In outlining this program Admiral Land made the following explanation:

"(1) The construction of three modern passenger vessels of the improved 'Coolidge' design for operation in the trans-Pacific service. The three new vessels, together with the 'Coolidge,' will make it possible to maintain a fortnightly trans-Pacific service.

"(2) The construction of seven or eight fast cargo vessels of a modified C-3 design, with a minimum 16½-knot speed, for operation in the round-the-world service. These vessels will make it possible to maintain a fortnightly round-the-world service. By combining the fortnightly sailings of these vessels with the trans-Pacific vessels, the Pacific coast will have a weekly sailing from the Pacific coast to the Orient by fast American-flag ships.

Fast Service to Europe

"(3) The construction of from five to six vessels of a special design for operation between the Pacific coast and the east coast of South America.

"(4) The construction of five or more vessels of a modified C-3 design, with at least 16½-knot speed, for new fast service between the Pacific coast and Europe, to operate on a fortnightly basis.

"(5) The construction of four or more fast cargo or combination vessels for fortnightly operation from the Pacific Northwest to the Orient, with a speed of at least 16½ knots. Whether such vessels should be cargo or combination type has not as yet been determined."

It was pointed out by Admiral Land that efforts are being made to induce the investment of private capital in a sufficient amount to

make possible the construction of these vessels for private account, but he said "the commission will not allow the search for private capital to further retard the completion of the building program, which is so urgently required by the Pacific coast."

INDUSTRIAL ECONOMICS BUREAU FOR FTC PLANNED

Various reactions have followed the recent monopoly message of President Roosevelt and a good many underground stories have developed as to certain sections.

One story deals with the suggestion that the government set up a bureau of industrial economics. As the department of commerce has had such a bureau in mind for at least two years, those who follow the situation closely in Washington were interested in the fact that the Chief Executive had not connected up this proposed bureau in any way with the department.

It has developed subsequently, that the President, while not saying so in his message, has in mind placing such a bureau under the federal trade commission instead of the department of commerce. It is believed on good authority that officials of the department of commerce have known about this situation for some time, but did not want such a bureau under their jurisdiction because the President has in mind making it compulsory for business to furnish certain information.

Information collected by the department of commerce up to this time has been on a purely voluntary basis and officials of the department felt it would materially weaken their contact with business if they changed to a compulsory basis.

Although this bureau has been agitated for several years by Donald Richberg, former head of the NRA and the department of commerce, there is little chance that it will be authorized during the present session of congress.

PURCHASE OF 554,000 TONS OF MANGANESE URGED

The subcommittee of the senate committee on military affairs, of which Senator Thomas, Colorado, is chairman, met in executive session, last week, in connection with the bill of Senator Miller, Arkansas, providing for the purchase for the United States of domestic manganese ore amounting to 554,000 tons manganese content.

While no details of the hearing are available, it is understood that representatives of the navy, war, commerce, interior and state departments, federal trade commission and United States tariff commission were heard. Although domestic manganese producers are bringing pressure for action on this bill, it is doubtful if it can become law at the present session.

It is understood that all representatives of government departments opposed the form of the Miller bill, although in sympathy with its purposes. Therefore, at the conclusion of the hearing, Senator Thomas asked the government officials to constitute themselves a committee to draw up a bill to include the purposes of the Miller bill and one which they could indorse.

Dr. John W. Finch, director of the bureau of mines, in a talk last week declared that the immediate purchase by the federal government of adequate stockpiles of strategic minerals is one of the most effective means of meeting present problems of national defense. Among the nine minerals which he referred to as "strategic" were manganese, tin, antimony, tungsten. Iron and steel he classed in another list as "critical materials."

An annual appropriation by the government of $500,000 was recommended by Dr. Finch to be used by the bureau of mines and geological survey for a comprehensive study of ways and means of adapting domestic reserves of strategic minerals to a permanent solution of the mineral problem.

ROPER APPROVES ANNUAL WAGE PLAN FOR LABOR

There has been so much talk regarding an annual wage for labor that Secretary of Commerce Roper was questioned on his attitude at a recent press conference.

Secretary Roper stated that he is of the opinion "that it would be wonderful for any laborer if he knew definitely what he was going to get in a 12-month period." He stated that, while he had looked into the building situation in connection with the annual wage, he believed that there might be exceptions on the annual wage question in some industries but "I do believe that an annual income known to a family is of far greater importance than what they get for a day wage, which probably will run much less time than the year."

Mr. Roper said that he did not know of any steps being taken either by his department or the administration to encourage or facilitate the adoption of an annual wage plan.

CALLS IDENTICAL BIDS PRIMA FACIE EVIDENCE

In his message asking congress to revise antitrust legislation the President alluded to identical bids and asked that "proof by the government of identical bids, uniform price increases, price leadership, higher domestic than export prices or other specified price rigidities might be accepted as *prima facie* evidence of unlawful actions." He mentioned the steel and cement industries, where, he said, in the face of falling demand prices have remained firm while payrolls have shrunk as much as 40 or 50 per cent.

This attack on current pricing methods appears to be another attempt to obtain a weapon against the basing point system, which has been under fire by the administration for long time.

WANTS GOVERNMENT TO BUY, OPERATE STEEL INDUSTRY

Representative Teigan, Minnesota, has introduced a bill in the house "to provide for the acquisition by the federal government and the public ownership and operation of the iron and steel industry of the United States." The bill was referred to the house ways and means committee.

WAGE-HOUR BILL STILL BONE OF CONTENTION

The lower house is in another battle on the hours and wages bill. What the outcome will be is a matter of conjecture, but those closest to the situation feel sure the bill will not become law at the present session. In the event that by some fluke the bill passed the house, there is definite talk that it would be filibustered in the senate.

Both John Lewis, of the CIO and William Green of A. F. of L., while neither is satisfied with the bill as it stands, are anxious to get some kind of hours and wages bill on the statute books which will at least make them feel they have won a moral victory. The President also definitely no later than last week urged that a bill be enacted.

FOREIGN TRADE MUST BE BUILT BY RECIPROCITY

Henry F. Grady, vice-chairman of the United States tariff commission, addressing the American Trade Association's executives last week on the reciprocal trade agreement program of the United States, said that this program "is the only practical way to rebuild our foreign trade, so necessary for the general welfare of the United States.

"Through trade agreements," said Mr. Grady, "we gain markets for our exports and secure co-operative action to lower the trade barriers menacing international trade.

"This program is based on the principle that more business is better than less business; that trade and production of all kinds are intimately associated; and that trade, either domestic or foreign, cannot be cut off without affecting employment and profits in industry and the welfare of agriculture."

Defense Program Requires Provision For Quick Mobilization of Machine Tools

■ ONE of the first industries to be mobilized in the event that the United States ever again is forced to resort to arms is that devoted to the production of machine tools. Appropriately, therefore, the state of the national defense was a principal subject of discussion at the spring convention of the National Machine Tool Builders' association last week.

A comprehensive plan of industrial mobilization in case of war, it was revealed, has been set up on paper. Some 10,000 plants have been earmarked for production of identified machine tools and accessories, munitions and parts. On the other hand, as the plan now stands, there is bound to be a serious delay, in the event of an emergency, before the earmarked plants can organize for volume production.

The war department appropriation bill now in conference in congress is expected to authorize the expenditure of $6,500,000 to $8,000,000 for tools, gages, jigs, fixtures and the like for production of munitions. The purpose is to create this equipment and have it on hand so that the process of getting into production may be materially shortened. Indications are that this bill will be passed at this session.

Educational Orders on Munitions Would Help Preparedness

Another bill before congress would give the war department authority to place "educational orders" with plants earmarked to produce munitions requiring special equipment and technique. This bill would permit payment of prices that would cover expenses. It is intended to encourage companies to provide facilities and train mechanics in the production of munitions for which they are earmarked. This bill has the approval of the house committee.

It is highly dubious whether these measures are sufficient to guarantee our ability to organize quickly for defense. Industrial mobilization for war is a gigantic undertaking. When the United States entered the World war in April of 1917 it had experience, equipment and trained men as a result of producing war materials for various European powers. And yet 14 months elapsed before we had an effective army at the front. During that time we had no defense problem to complicate our production program.

Recent years have seen the development of a new technique of territorial conquest. It is a process of boring in, of political maneuvers and establishment of economic ties. This technique is in process in various parts of the world. Recent evidence indicates conclusively that this technique rapidly is becoming of greater concern to the United States.

Cost of Being Ready for Defense Is a Profitable Investment

We have reached a point in our history where there can be no controversy about a defense program. In today's world treaties do not count. A policy of neutrality cannot serve. Weakness invites aggression. Only strength commands respect. How close we hover on the brink of war was made clear to the American public at the time of the sinking of the PANAY.

A strong defense is vital as a guarantee of our future and this country can afford to spend money that will safeguard us against aggression. Designed to keep us out of trouble, the investment would yield a handsome profit, if trouble does come, in saving lives and treasure due to adequate preparedness.

Index of Activity Registers Moderate Decline

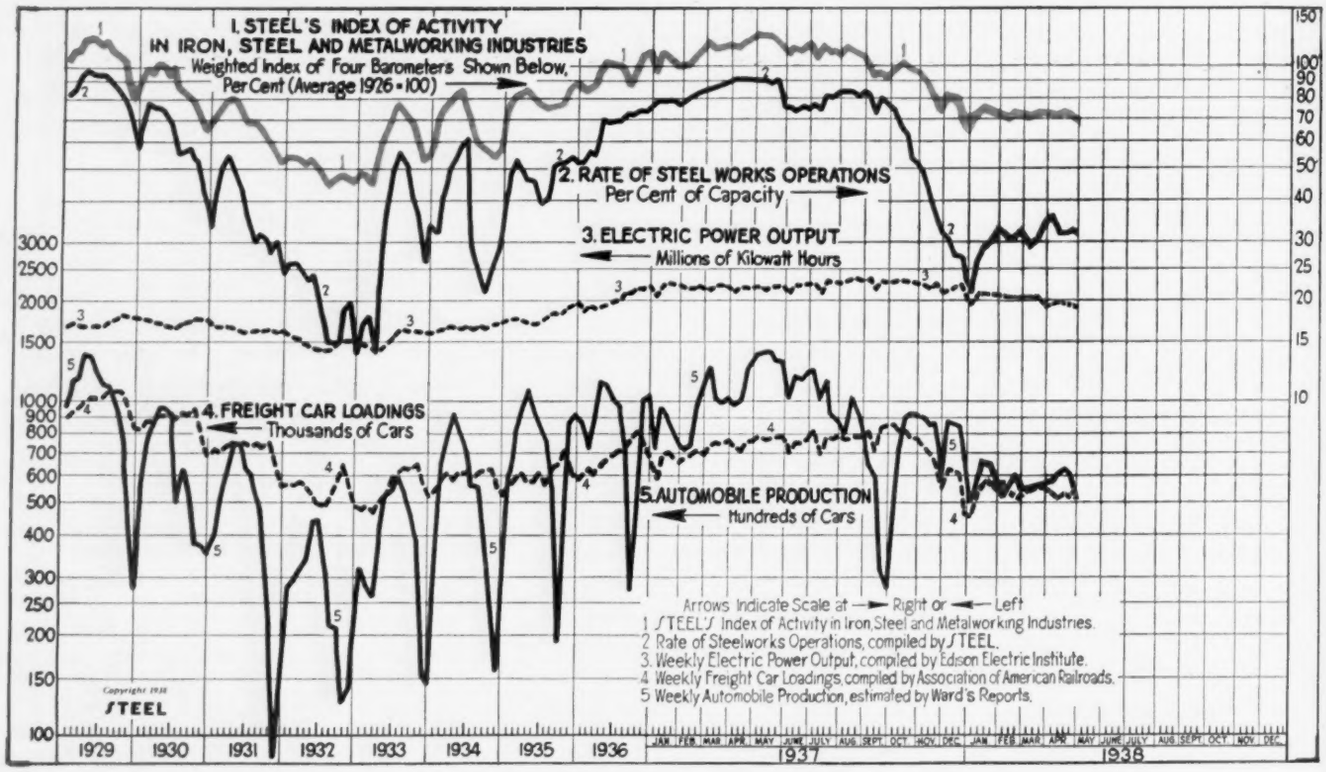
■ BUSINESS has reached the first week of May without exhibiting signs of new demand in sufficient volume to halt the seasonal decline in industrial activity of the past few weeks. Due to this sluggishness in the iron, steel and metalworking industries, STEEL'S index receded to 68.4 per cent in the week ended April 30.

The weekly barometers of a few fields, as for instance engineering construction, have shown moderate gains but the majority of business statistics indicates a further drift to lower levels.

The decline in STEEL'S index in the week ended April 30 reflects the disappointing reports for three out of four of the business indicators from which the index is derived. Rate of steelmaking operations lost the half-point gained in the preceding week and there are indications that this important barometer may continue to drift listlessly during the next few weeks. Electric power output lost ground for the third consecutive week to 1,938,660,000 kilowatt-hours, breaking into new low levels for this year. This is the lowest point this indicator has reached since the week ended May 22, 1936.

The third important barometer to register a loss in the week ended April 30 was automobile assemblies. Production suffered a decline of about 10,000 units, which represents the sharpest curtailment in any week of 1938. It was due in part to labor disturbances and to the decision of the industry to curtail operations, now that the seasonal peak has passed.

Revenue freight carloadings was the only barometer composing STEEL'S index to register a gain in the week ended April 30. However, average weekly loadings so far this year are under 550,000 cars, against a weekly average of slightly over 750,000 cars in the similar period last year.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 - 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 2.4 points to 68.4 per cent in the week ended April 30:

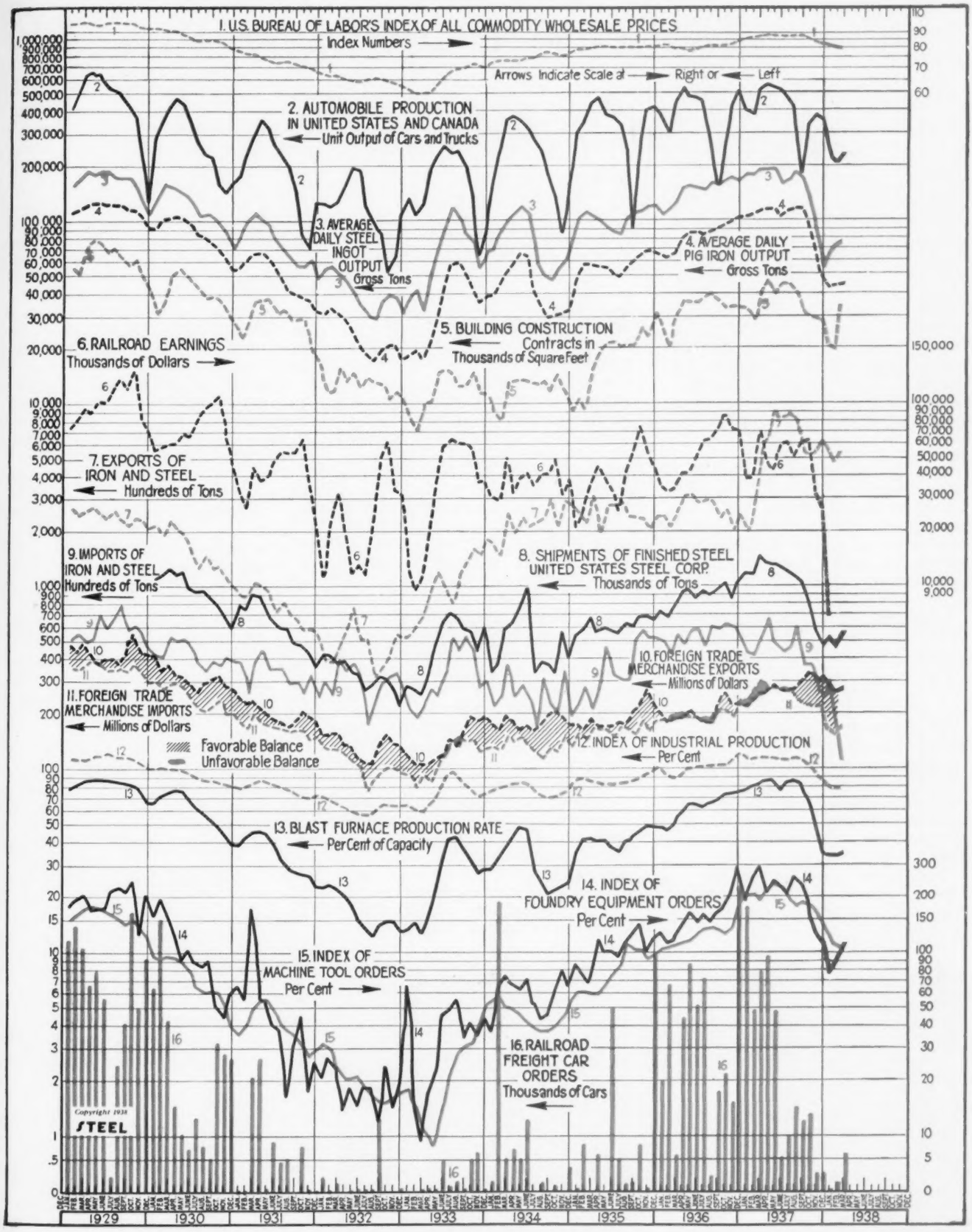
Week ending	STEEL'S Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8	112.7	30.0	87.0	2,014	2,212	556,664	748,993	57,438	101,684
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4	114.0	35.0	90.0	1,975	2,200	572,952	761,109	56,800	101,046
Apr. 2	72.0	112.0	36.0	91.5	1,978	2,146	523,489	726,687	57,500	97,005
Apr. 9	71.3	112.8	32.0	91.5	1,990	2,176	521,978	716,044	60,975	99,196
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767†	761,182	60,563	133,164
Apr. 30	68.4*	123.9	32.0	91.0	1,938	2,193	539,480*	782,423	50,755	139,475

*Preliminary. †Revised.

STREND

Key:	March, 1938	Key:	March, 1938	Key:	March, 1938	Key:	March, 1938
1	79.7	5	34,055,000	9	11,827	13	34.5
2	236,300	6	*2,136,481‡	10	275,711,000	14	114.6
3	74,513	7	526,833	11	173,405,000	15	100.4
4	47,851	8	572,192	12	79.0	16	680

*February. ‡Deficit (not shown on chart).



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

Iron and Steel Engineers Stress Strip Mill Advancements

■ A LAYMAN has no conception of the technical advancements that have been made in the steel industry in the past 31 years. There was a time when coke oven and blast furnace superintendents were rarely on speaking terms. Today, the coke oven superintendent is as much interested to see that his coke is of the right structure and size to suit the burden as the blast furnace superintendent is himself.

This is the observation of S. J. Cort, general manager, Maryland plant, Bethlehem Steel Co., Sparrows Point, Md. Mr. Cort spoke at the informal dinner which opened the annual spring conference of the Association of Iron and Steel Engineers, Lord Baltimore hotel, Baltimore, April 28-29. A report of his radio interview over a Baltimore station was presented in last week's issue.

Life of Lining Increased

Blast furnaces, Mr. Cort continued, have made wonderful strides in quantity, quality and life of lining. Today it is common to have a 1000-ton furnace producing daily 1000 tons of iron of uniform analyses, and to get from 1,500,000 to 2,000,000 tons per lining.

In the steel plant, he said, the old rule of thumb has been eliminated and steel today is being made on a firm scientific basis. In the early days we were fortunate to obtain a 4000-ton monthly average of open-hearth steel per furnace. Today we have furnaces that produce regularly over 13,000 tons of ingots per month, with about 60 per cent of the B.t.u.'s that were once necessary, due to the advancement in the combustion art, where the regulation of the furnace is taken out of the hands of the first helper and is done with automatic control. With the development of the carbometer, regular slag control, the pyrometer, and proper mold design, it is possible to produce regularly the desired quality and to produce over 99 per cent of the heats within the chemical specifications desired.

Mr. Cort pointed out that the same advancement has been carried through the soaking pits, which have been made automatic. The heating can be regulated to any desired temperature without the danger of burning or injuring the ingots; and, the blooming and slabbing mills, due to advancement in motor and control design, are able to produce a much greater and better quality of semifinished material.

Think what the hot strip mill has been able to accomplish, with its enormous tonnages, accuracy of gage, and with a speed and delivery up to 2000 feet per minute.

The advancement in heat treating furnaces has also kept pace with the other branches of our industry, and the steel industry is able to furnish the consumer with a quality of product that would have staggered the imagination of the steelmaker at the birth of your association. Today we are able to furnish a product in the closest of tolerances, with the proper physical and chemical analyses to give the desired grain size, drawing qualities, etc., that the trade is insisting upon.

The speaker emphasized that the object of the steel industry is to give a better product and to ever increase its uses. A bigger volume of our product is swinging over more and more to the consumers' goods rather than capital goods, and this is probably natural, due to the great development that has been previously made in the capital goods industry. In conclusion Mr. Cort stated that the tendency is growing more toward lighter weight with higher tensile strength and a steel that has greater resistance to corrosion.

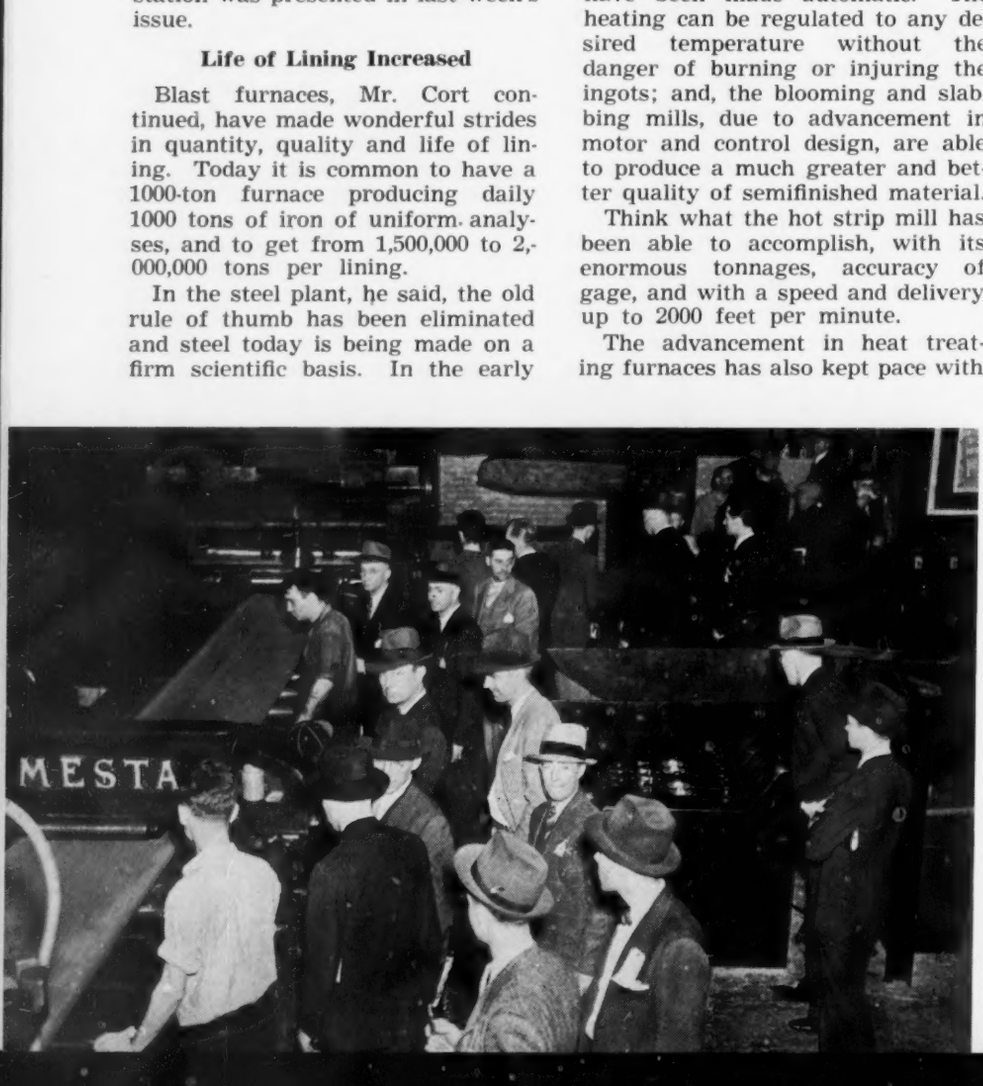
Abstracts of some of the papers presented at the Thursday evening and Friday morning sessions follow:

Instrumentation of Hot and Cold Strip Mills

PART I

By J. L. Whitten, Lee Wilson Engineering Co., Cleveland

■ For controlling the operation of the slab reheating furnaces it has become general practice to apply automatic regulation to the fuel and air to the soaking zone of the fur-



Exit end of the continuous pickler which serves the new 56-inch hot strip mill of the Bethlehem Steel Co., Sparrows Point, Md. Pickled strip is shown in transit to the coiler. The shear in the foreground eliminates the section where the ends have been welded; the unit in the background is for trimming the edges of the strip before coiling

nace. With the idea of treating this zone as a soaking pit, the temperature is measured by a radiation tube or thermocouple placed to take the temperature on the inside face of the roof. This temperature impulse, transferred to a recording controlling potentiometer, of either electric or air-operated type regulates the fuel input to the furnace in accordance with the demands of load variation, full furnace hold-overs or shut down periods.

While the uniformity of slab heating can be best accomplished by automatic temperature control of the soaking zone, it is not usually thought necessary to control the temperature of the heating zones of the furnaces, although some form of multiple temperature records should be used to inform the operator of the conditioning of the steel in preparation for soaking. The same equipment is needed for recuperative temperature—waste gas in and out—and preheated air. To protect the exhauster from possible damage from excessive air temperature, temperature control equipment should be installed to control a cold air bleeder positioner to insure that the preheated air temperature be held below a point which would be dangerous to the furnace.

Equipment for taking the temperature of fast moving strip accurately and recording a full scale reading in 3/5-second now is available. Every variation along the length of the strip can be measured and the sheet temperature can be obtained end to end as it passes the turntable.

Detects Bearing Temperature

Equipment for detecting the temperature of bearings is perhaps more essential for such installations as use roller bearings where the actual temperature of the bearing ring will determine the ultimate effect of metal fatigue and failure. This equipment, where it has been supplied, is usually in the form of a 4-record instrument to record the temperature at the top and both sides of the bearing for the backing-up roll and the bottom and both sides for the bottom backing-up roll.

The next unit of operation for which equipment is necessary is the continuous pickling lines and the batch picklers. When it is realized that most continuous pickling lines are to be operated with the temperatures held within plus or minus 3 degrees Fahr. the only essential is for accuracy and this means thermocouple and potentiometer measurement of the temperature. The cost of acid and steam is enough to warrant exact control even if the metal surface treatment did not. All of the new continuous pickling lines have been equipped with potentiometer controls and the results have been most gratifying.

On all furnaces of the radiant tube type there has been developed an interlock between tubes and steel temperature. If the type of furnaces required two position firing operation this interlock is affected so that if either tubes or steel are high in temperature, the control valve is moved to its minimum position. The development of these central panel boards has also enhanced the development of special types of plug switches and receptacles for both thermocouple and control circuits, all of which has materially aided in the central control operation.

Records Properties of Gas

With the annealing department work there has been developed a recording equipment of the thermo-conductivity principle which can be used to determine whether the gas is oxidizing or reducing and the intensity of the reducing properties. Since the reducing properties of the gas are dependent on the hydrogen and carbon monoxide contents and it has been found that these two properties of gases when developed at elevated temperatures are correlated, any recorder which can detect the quantity of hydrogen in the gas will really measure its effectitve properties as a reducing agent. In general, most of the gas machines can well utilize such a check as this and the equipment should be arranged so that each individual gas generating machine can be analyzed as well as the main line.

The continuous normalizer for strip or sheet steel will embody a number of zones of control and it has been a generally accepted principal that if the furnace for this purpose is over and underfired that each zone of control should have separate instruments for the firing over and under the sheet, that is, two controllers per zone. Since the normalizing furnace is invariably subject to considerable load variation, temperature controllers for this particular duty should be of the load compensating type.

Ingenious galvanizing settings have been developed which pickle the material, dry it, galvanize it and stack it. Naturally temperature control of both picklers and spelter operations are required and equipment for this purpose should be included.

For tinning operation the control of the temperature of the tin and palm oil baths are absolutely essential and it is generally conceded that these should be of the best potentiometer type of controls available. The necessity of close regulation of these temperatures emphasize that these equipments should be recording potentiometers which they have not generally been in the past. The tendency is certainly toward the recording type of equipment in these units and also toward the equipment which will recognize the heating requirements of various tin gauges in both tin and palm oil gas.

Three well-known personages in the hot strip industry. From left to right, J. H. Vohr, general manager, Granite City Steel Co., Granite City, Ill.; A. S. Glossbrenner, superintendent hot strip mill, Youngstown Sheet & Tube Co., Campbell, O.; and R. H. Stevens, chief engineer, Maryland plant, Bethlehem Steel Co., Sparrows Point, Md.

PART II

By R. H. Ellis, United Engineering & Foundry Co., Pittsburgh

■ The continuous hot strip mill, with its variable speed motor, now is equipped with central operating pulpits in which complete speed and power indicating meters are installed. The motor rooms are provided with graphic meters and the more modern mills are installing on the mill floor, graphic or indicating meters for the use of roller. The roughing mill, at its central pulpit, although not equipped with speed indicators, has its quota of power meters and, in the case of the edger rolls, their speed and powers are indicated. On slab pushers at broadside mills it is important that load meters be mounted at the operator's pulpit to aid him in the proper operation of the slab pusher, as this

machine is not supposed to do the mill motor's work and it is imperative that only the proper value of push be maintained.

The hot run table and coilers are two important locations where speed and load meters are essential. Hot strip traveling at 2000 feet per minute is not to be trifled with and the coilers and table must be perfectly matched.

The cold mills, although less spectacular, have perhaps enjoyed even a more rapid rise to fame. Speed jumped from 100 to 1500 feet per minute and above. Tension reels were installed, tandem mill back drags, automatic uncoilers, etc. Here the speed and power meters were again pressed into service, but also, automatic devices, unseen by the mill operator, are the real reasons for the success of the cold mill. Tension regulators, the heart of the cold mills, have been developed from the original Terrill regulator to high-speed vibrating units. Tension measuring units are now available to read the strip tension between stands; flying micrometers to measure the thickness of the material being delivered from the rolls; all combining to improve product and speed up production.

New Unit Replaces Indicator

Besides purely technical requirement, some aids for the physical benefit to the operators have been installed; one of which has been the use of the so-called "productimeter." This unit replaces the mechanical dial indicators which, with the advent of large housings, climbed into almost unreadable heights, and so, by the use of selsyn ties and counters, the screwdown indication was brought down to the operator's eye level. Beyond the physical benefits, this unit actually gives a better reading than the old dial. It reads, for instance, in cold mill work, directly by the use of numbers to 0.001-inch and also reads the actual opening of the roll, whereas the old dial lost its value after one complete turn.

Selsyn units are also now being used throughout the mill for other purposes. One important use is to transmit signals from hot mill coiler to finishing mill roller; giving a quick, accurate story regarding the size and condition of the steel, thus doing away with the old "arm waving" signals.

One interesting and important development is the pressuremeter for indicating the static load on a mill housing developed by the screwdown. This unit, primarily developed during the time when bearing capacities were not all to be expected, and when too much load was detrimental to the bearings and shortened their life, has now, due to improvement in bearing design, found a new use. These units can be used to indicate the preset loading of a mill, which, when rolling cold thin material such as tin plate, can provide a means of "setting up" the mill for proper reduction without the use of trial coils. For example: Rolling from 0.072 to 0.010-inch in a 4-stand tandem mill, all the rolls are set below the zero opening, that is to say:—the mill housing is stretched. Now after new rolls are inserted in the mill, the operator, from his past experience, knows the proper amount to stress his mill housing in advance of rolling so that the proper drafts are obtained.

In discussing Messrs. Whitten's and Ellis' paper R. E. Gelder, works metallurgist, American Rolling Mill Co., Ashland, Ky., stressed the importance of planning placement of instruments within the plant. If the instruments are located in a convenient place, the speaker pointed out, employes will make use of them and the control will be more accurate. He emphasized that normalized products carry oxides and these along with mill scale cause considerable difficulty in processing. Maintenance of the pickling solution at constant temperature, he warned, is therefore of utmost importance.

The potentiometer operated with a lead sheathed thermocouple is highly efficient. The speaker drew attention to the wisdom of choosing men who know how to take care of instruments. Instruments must be understood before better quality and better operating costs can be obtained.

A pyrometer service foreman was recommended by the author in establishing an instrument department. Usually seven men are included in his department and their duties include visiting every control equipment, removing the charts, checking up the instruments, periodically taking the instruments to the laboratory and checking them for accuracy. The speaker warned that no adjustment of instruments should be made except by the pyrometer men from the service department.

Lubrication Chemistry

By G. F. Bowers, technical department, Standard Oil Co. of Indiana, Chicago

■ Chemical structure of the molecules of a petroleum lubricant is known to be complex but relatively speaking the exact structure, with but few exceptions, is unknown. This condition obviously makes the problem of forecasting performance more difficult so improvement comes only as a result of research and experience.

Circulating oils have been in use for many years; however, their use is still being extended and, further, the demands made on the oil are becoming more severe. The application of chemistry has resulted in making available products better able to meet the demands. There are certain requirements circulating oils must meet and when expressed in terms of characteristics of the oil, they are:

1. The correct viscosity to furnish adequate lubrication without excessive fluid friction.
2. A pour test sufficiently low to insure fluidity at any temperature that may be encountered in the installation.
3. A good demulsibility to permit removal of water which gets into any system.
4. A high stability to insure resistance to oxidation and sludging.

It is particularly in demulsibility and stability characteristics that chemistry is involved. Unquestionably, other things being equal, the less polar the compounds, the better the demulsibility.

Oxygen Attacks Oil

The word "stability" has been used so loosely that it may not always convey the desired meaning. In this discussion it will be used to cover resistance to deterioration, oxidation and sludging of an oil in service. In a circulating oil this characteristic is of prime importance and cannot be stressed too strongly. The oil is being attacked continuously by oxygen so an aldehyde may result, and then a keytone and so on. This oxidation reaction continues until a complex branch chain high molecular weight oxygenated compound results.

The amount of oxidized oil can be determined since it is essentially insoluble in naphtha (hexane) but soluble in chloroform. Since this oxidation may continue until sludges or even coke results, circulating oils should be checked regularly to determine the amount of oxidized oil present. Another check is determining the neutralization number since as the oil oxidizes to acidity this test will show the change.

The actual deterioration cycle in a circulating system therefore would be about as follows: Unsaturated compounds in the presence of air oxidize to form acids. These acids react with metals to form metallic soaps. These soaps and sludges may deposit in the system and restrict the oil flow, thus causing an increase in temperature. They cause an increase in viscosity and therefore more fluid friction so

there is an increase in temperature. The rate of oxidation is influenced tremendously by temperature. As a matter of fact the rate of oxidation doubles for about every 20 degrees Fahr. rise in temperature. The rise in temperature due to oxidation causes more rapid oxidation so a vicious circle results which keeps on and on until the oil is no longer fit for use.

The most stable circulating oils are secured by refining the oil to give molecules which are as nearly as possible saturated straight chain hydrocarbons.

In addition to the process of refining, addition agents may be used. Materials which tend to prevent the reaction of oxygen on the product are inhibitors. Unfortunately most inhibitors are water soluble and therefore not usable. Many are polar and themselves unstable in the presence of heat. There are, however, inhibitors which can be used in certain oils for specific types of work which give excellent results.

The lubrication of a turbine is a typical example of the use of low-viscosity circulating oil. Most turbine oils are highly refined products with good stability and can be expected to give a few years service before they oxidize to the point that makes them unfit for service. A highly refined inhibited turbine oil, however, will last indefinitely.

There are other addition agents besides inhibitors which have great merit. A typical example being solublizers such as have been found so effective in diesel engine lubricating oils. Solublizers are products which when used with properly selected oils prevent the deposition of partially oxidized and other wise gummy and tarry products. In this instance oxidation does occur but the products of oxidation do not separate or deposit to give the hard carbon, stuck rings, etc., so common in diesel operation.

Unquestionably the future will see increased concentration on the chemistry of lubrication and a continual improvement in the quality of the lubricants available to industry.

Power Requirements of 56-Inch Hot Strip Mill

By F. O. Schnure, electrical superintendent, Bethlehem Steel Co., Sparrows Point, Md., and R. H. Wright, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

■ TWO of the chief engineering and economic problems arising in connection with the installation of a new hot strip mill are the layout of the power system and the selection of the drives. Because of the large amount of power required, few steel plants can assume the additional load of a new hot strip mill without major additions to the power system. The determination of the best means for supplying the additional power is largely an economic problem.

At the time the new 56-inch hot strip mill, No. 2—42-inch tandem cold strip mill and 10-inch rod mill were being considered momentary peaks up to 85,000 kilowatts were being carried regularly with no spare capacity available. To provide for the requirements of the new mills it was estimated that it would be necessary either to install a 30,000-kilowatt generator unit or to provide an equivalent increase in purchased power capacity. After a thorough study had been made, it was decided that it was desirable to purchase the additional power required.

Select 60-Cycle Service

Because of the inherent advantages of 60-cycle service such as lower cost of apparatus, greater availability of equipment and larger range of synchronous speeds available for motor drives, 60-cycle service was decided on for the new mills.

An interesting feature of the frequency changer installation was the addition of a 3500-kilowatt, 600 volt direct-current generator on the end of the set. This generator supplies power to No. 2—42-inch tandem cold mill. This combination represents an economy in space, foundations, auto-transformers and switching equipment and allows the frequency changer to be started by Ward-Leonard control from the adjacent 3500-kilowatt motor-generator on No. 1 tandem cold mill, using the 3500-kilowatt generator on the frequency changer set as a motor. Thus a normally tedious starting job is simplified greatly. Both the 25 and 60 cycle machines are provided with amortisseur windings so that in an emergency the set can be brought up to speed by connecting the 25 cycle end to a generator in the power house and bringing the set and the generator up together.

A typical day's run on 0.090 and 0.075-inch strip gave an overall energy consumption of 82 kilowatt hours per gross ton charged. This figure includes power for mill auxiliaries and water and steam systems. The maximum instantaneous demand observed to date is 28,000 kilowatts and the over all power factor under load usually varies from 97 per cent lag to 97 per cent lead. These figures are considered representative of the performance of the mill when operating at normal.

Each roll of the vertical edger is driven by an individual 300 horsepower 500 revolutions per minute, 440 volt squirrel cage motor. One motor is located in the motor room and one in a pit under the mill floor. This arrangement simplifies the mechanical design of the edger and the operation is satisfactory. Load division between motors is never perfect, but the motors are of ample capacity and the method of drive is satisfactory from the standpoint of mill operation.

A study of the load conditions proposed for the mill indicated that synchronous motors would be satisfactory for the roughing train provided the roll speeds were selected so as to keep the peak loads within reasonable limits. Synchronous motors were desirable because of simplicity of control and lower overall cost as compared with other forms of drive. It is almost a universal custom to operate synchronous motors with reduced excitation at light load to reduce losses and heating. However, this has been found to be an unsafe practice for strip mill roughing stand drives.

One of the questions which has interested steel mill engineers is the effect of higher mill operating speeds on the energy consumed by the main drives. In order to shed some light on this interesting question, tests on several schedules were worked out in detail and the results plotted in curves of net energy consumption per net ton rolled against elongation. The curves obtained in this manner indicate that modern high-speed mill require appreciably less energy for the main drives per unit of work done, than older slow-speed mills.

Other papers presented included "Forged Rolls," by J. R. Adams, superintendent, special products, Midvale Steel Co., Philadelphia; and, "Special Problems of Steel Mill Electrification," by L. A. Umansky, General Electric Co., Schenectady, N. Y.

Furnace Cement Can Be Used Indefinitely

■ Cement for vacuum furnaces which does not become brittle, adheres to any surface and can be reused indefinitely has been developed by Westinghouse Electric & Mfg. Co.

Solid at room temperature, the cement becomes increasingly softer at higher temperatures, and can be reclaimed, remelted, and used again. It will stick to rough or smooth surfaces to form vacuum-tight joints.

When applied to the vacuum furnace, the cement is smeared over the joints of the cap closing the inner chamber of the furnace. A torch is used to make the compound flow readily, and a heated putty knife to spread it.

Reducing Corrosion by Choice of Steels and Protective Coatings

■ CORROSION of metals and protective coatings were subjects occupying attention of members of the Cincinnati, Columbus and Dayton, O., chapters of the American Society for Metals at their annual tri-chapter meeting at the Engineers' Club, Dayton, April 27. About 200 attended the meeting which featured morning and afternoon technical sessions and a luncheon.

Discussing "Planning and Significance of Corrosion Tests," C. W. Borgman, National Tube Co., Pittsburgh, presented considerable mathematical data by which corrosion results can be predicted to a degree. If it is desired to determine the influence of four alloying elements on corrosion of an alloy in typical soft water, it is possible to determine what combinations shall be used. Also, with a factorially designed test, in which secondary interactions are compared, the relative advantages of increases in alloy "A" in the presence of alloy "B" may be determined, stated Mr. Borgman.

Environment Is Important

Dealing with "Rustless and Stainless Steels," Dr. V. N. Krivobok, Allegheny Steel Co., Brackenridge, Pa., emphasized that no metal today will withstand every corrosive condition, and it is important for good service results to realize significance of the "environment" in which the material is placed. Environment factors responsible for good service, as against poor service, depend upon the concentration, temperature and hydrogen ion concentration of the corrosive media; homogeneity of the metal; surface condition, simultaneous presence of liquid and vapor phases; structure of the metal; active or passive status of corrosive media; and whether there may be a change in conductivity of the corrosive media.

When stainless materials are welded, the material adjacent to the weld changes in composition and nature as a result of heat treatment from the weld, the speaker asserted. The question of gage of the material also enters the problem. It is necessary frequently to weld the first bead layer using a rod of the same composition as the sheet; for the second layer a rod of different composition may be required. In high chromium alloys, for instance, a rod of chrome-nickel composition often is used for the second bead.

Molybdenum and tungsten improve mechanical properties of stainless steel; copper and silicon improve corrosion resistance; titanium, columbium and aluminum diminish the hardenability properties under subsequent heat treatment. Dr. Krivobok stated that ductility properties may be varied from 5 to 50 per cent with the same cold rolled strength, as carbon and chromium are varied in small amounts.

Selection of a corrosion test should be governed by actual test conditions, and if the material will be under stress in service, the test also should be made under stress. To produce an alloy less susceptible to carbide precipitation and intergranular corrosion in service, vanadium, titanium, tantalum, columbium and molybdenum additions are used. Molybdenum, a comparatively new addition to stainless, slows down the carbide precipitation, when used in amounts from 2.75 to 3.25 per cent in the 17-14 and 19-14 types of chromium-nickel alloys. These alloys containing molybdenum show resistance to pin-hole corrosion, stand up well in a 10 per cent solution of ferric chloride, and do not show attack in Krupp solution until after 500 hours.

Titanium is used in amounts up to six or seven times the carbon content, and if no welding is done in fabrication, stainless containing it will stand up well in service. When titanium-bearing alloys are welded, considerable titanium is lost in welding the first bead, Dr. Krivobok pointed out, and the welded area is liable to be more susceptive to corrosive media than the surrounding areas. In material over ½-inch thick, welded and used at temperatures from 800 to 1500 degrees Fahr., columbium to the extent of ten times the carbon content is required to prevent weld attack.

Longer Car Body Life

A material relatively expensive as to original cost may compete with a relatively inexpensive material provided weight saving properties, tensile strength and corrosion resistance are satisfactory, said R. F. Passano, American Rolling Mill Co., Middletown, O., in discussing economics involved in the use of the low-alloy, high-tensile steels. Illustrating this point, he stated that the life of coal hopper car bodies before repairs are necessary has been exended to ten years by using ¼-inch copper-bearing steel for the bottoms and 3/16-inch material of the same type for the sides.

Light-weight, high-tensile chrome steel hopper cars built in 1935 are still in service with no corrosion evident, he continued. A relatively small increase in gage of copper-bearing steel containing 0.013-0.30 per cent copper—from 22 to 16 gage—shows a doubling in service life.

In the case of galvanized material, increasing the weight of the zinc coating effects an increase in life of the steel before rust starts ranging from three to five times that of material with a lighter coat. In certain localities, Mr. Passano continued, the zinc coat weathers away on the top side of the sheet, but remains on the bottom side. If the same sheet were uncoated, it would rust away at the same rate top and bottom. A 22-gage uncoated sheet exposed at Key West, Fla., lasted 2½ years; a 28-gage uncoated sheet lasted 1½ years. A 28-gage sheet with a 3¼ ounce zinc coating lasted 12 years. These figures illustrate the effect of gage and coating.

Dr. H. J. French, International Nickel Co. Inc., New York, also considered economic angles in the development of the new low-alloy, high-tensile steels. Requirements which a low-alloy steel must meet are: Adequate strength; good forming, welding and corrosion-resisting properties; and moderate cost.

Influence of Alloys

Copper, used in small amounts in these steels, shows outstanding results in reducing atmospheric corrosion. Nickel shows the same effect, except that it is required in larger quantities, usually from 0.40 to 2.0 per cent. Phosphorus, a new alloying element in these steels, is used in amounts from 0.10 to 0.20 per cent, and chromium ranges from 0.40 to 1.0 per cent.

Use of low alloy steels has reduced the weight of many large structures, Dr. French declared, because the yield point of these steels equals the tensile strength of ordinary steels. The low alloy steels produce strong welds, are free from weld hardening, and having a low carbon high yield point show load carrying ability which frequently is twice that of plain carbon steels, especially in the copper-nickel-molybdenum type of I-beam.

The meeting was concluded with the presentation of six short comments on "Protective Coatings." Subjects and discussors were: "Metal Plating," by George Long, Frigidaire Corp., Dayton, O.; "Hot Dip Coatings," by W. M. Peirce, New Jersey Zinc Co., Palmerton, Pa.; "Nonmetallic Coatings," by F. Pfarrer, National Cash Register Co., Dayton, O.; "Phosphate Films," by H. McVey, Parker Rust Proof Co., Detroit; "Sherardizing," by F. Lenell, Moraine Products Co., Dayton, O.; and "Bituminous Coatings," by G. Hoover, American Rolling Mill Co., Middletown, O.

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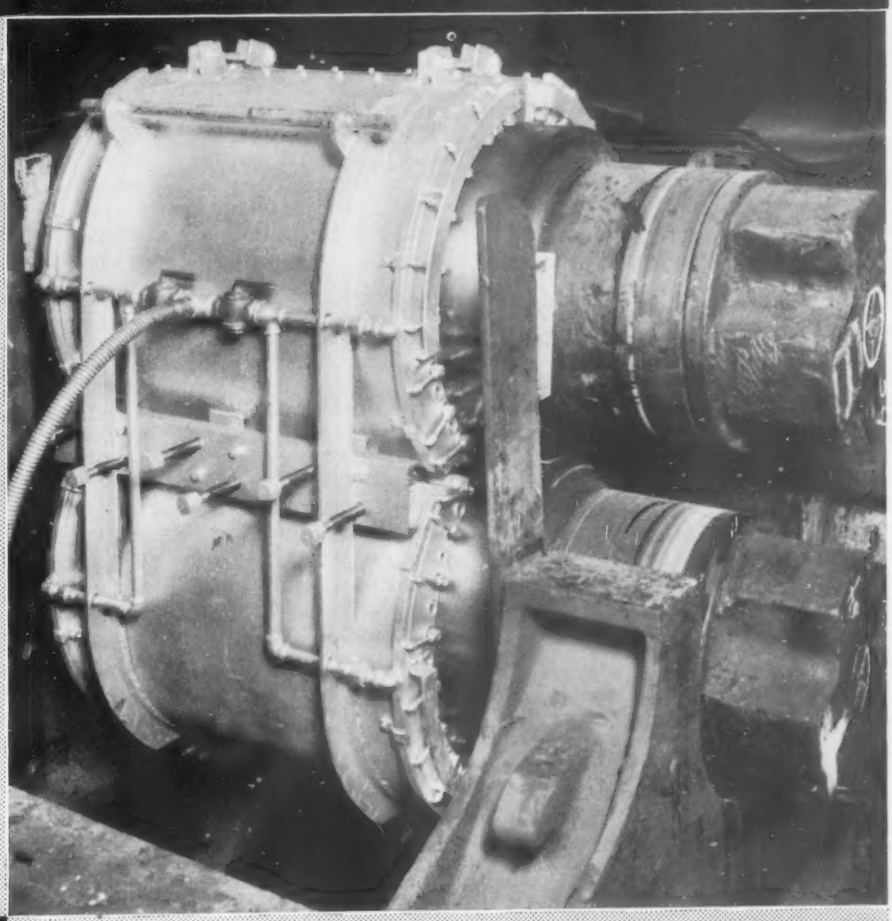

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KEMP of BALTIMORE

Major Use of Welding in Steel Plants Is in Maintenance Work

■ FIRST of a series of annual tri-state welding conferences, arranged so that engineers and operating men in the Western Pennsylvania district might have opportunity to hear outstanding authorities in the welding field, was conducted at the William Penn hotel, Pittsburgh, April 29. Approximately 150 attended an afternoon session and nearly 300 the concluding session in the evening.

The conference was sponsored jointly by the Engineers' Society of Western Pennsylvania and the Pittsburgh section, American Welding society. Need for such a meeting was felt because Pittsburgh does not have facilities to accommodate the national meeting of the Welding society, held each fall in connection with the National Metal congress and exposition. Interest shown in this first conference indicates success for future events.

Welded Repairs Last Longer

"Welding in the Production of Steel" was a subject discussed at the afternoon session by Robert E. Kinkead, consulting engineer, Cleveland. Maintenance and repair work is the most important field for welding in steel plants today, according to the speaker. Repairs made by welding often last longer than the original machinery, he declared, generally for the reason that better metal is used in the repair than was used by the manufacturer of the machine. This is because builders are aiming to meet buyers' demand for lower first cost.

Another important use of welding in the steel mill is that of welding coils of strip together in continuous operation. Mr. Kinkead said the welding equipment may be placed at three points—in a special recoiling line, separate from other production; in the pickling line; and ahead of the cold mills so that a continuous ribbon goes through the mills.

Length of the coils is limited only by the materials handling equipment which comes later in the production line. Two reasons are important for using longer coils, the speaker asserted: First, many customers are demanding longer coils; and second, scrap is cut down by reducing the number of ends which must be cropped off. At the same time, production on the continuous mills is increased by cutting down the number of threading operations.

Three common methods are employed for welding coil ends together. The first is torch welding the ends and grinding off the bead; this method is used largely in the separate recoiling lines. A second method is used of the automatic torch welder, which makes a weld on a skew and eliminates need for an additional grinding operation. This method is slow, especially on wide strip. The third method, which is the only one used successfully where time is a factor, as in the pickling line, is the flash welder.

Another important use of welding in steel production is in the manufacture of composite metals, such as clad steels. According to Mr. Kinkead, a considerable demand for this type of product has developed, particularly in hard surfacing applications as small die blocks or shear knives. Probably the largest use will be found soon in applications where different parts of a given piece are subject to different conditions, as in pipe.

In the second paper at the afternoon session, A. S. Low, vice president and chief engineer, Austin Co., Cleveland, described several buildings which his company had fabricated by using welding in the structural steelwork. The prime factor in modern exterior design, according to Mr. Low, is the method used in interior structural work. Welding aids in making more efficient construction and more attractive exterior appearance.

Design for Welding Lags

One hindrance to welding in construction work is in the building codes which are not yet set up in many localities to permit use of the process. The result of this, Mr. Low contended, is that welded structural design has lagged behind welding processes in common use in manufacturing procedure. Lack of knowledge of welding in municipal building departments has been a slowing factor in this process.

There seems to be a need for special structural shapes designed especially for welding, the speaker declared. The one most commonly used now is a T-beam, formed by splitting a standard I-beam. An interesting fact brought to light by experience of the Austin Co. is that an all-welded structure costs far too much to be practicable under present conditions. The ideal procedure is a combination of welding in the shop and both riveting and welding in the field.

Following an informal get-together dinner, the evening session was opened by brief remarks by P. G. Lang Jr., engineer of bridges, Baltimore & Ohio railroad, Baltimore, and president, American Welding society. A. E. Gibson, president, Wellman Engineering Co., Cleveland, and past president of the Welding society, also spoke.

Presenting the principal paper of the evening session on "Welding in the Construction of Cranes and Power Excavators," H. C. Hettelsater, executive engineer, Harnischfeger Corp., Milwaukee, emphasized the problems met in building excavating machinery and cranes through use of welding.

According to the speaker, considerable thought must be given to design of these machines because of the extremely hard service to which they are put. Especially is this true of the excavators. Extreme care must be taken in welding operations on various parts to insure long service life. Important also are the savings in weight effected through use of welded design on these machines in which moving dead weight is a prime factor in operating costs.

What You Want To Know About Air Conditioning

■ *Trane Air Conditioning Manual*, by William Goodman; cloth, 333 pages, 9 x 11¼ inches; published by Trane Co., La Crosse, Wis.; supplied by STEEL, Cleveland for $5; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This manual aims to present the modern knowledge of air conditioning in such a manner that the reader will obtain a clear picture of the simple relationships existing between the many apparently complex principles involved in the design of an air conditioning system.

As the book is an outgrowth of material prepared and used by Trane Co. for some time, its viewpoint is essentially practical. It is concerned primarily with the application of fundamental engineering facts to the design of air conditioning systems with a minimum of mathematics. Sixty-three pages of tables in a separate section, in addition to those throughout the text, greatly facilitate calculations and provide essential data.

Not only are those subjects covered directly connected with air conditioning but many others relating to this field such as pumps, compressors, electric motors, control systems, etc. A feature is the inclusion of practical problems at the end of each chapter to help the reader become acquainted with actual use of the material he has read.

With the manual comes a separate pad of large-size psychrometric charts for calculations, a specially designed rule to aid figuring, and a supply of cooling load estimate charts for recording data.

The automatic screw machine in the circle, the heavy duty punch press above and the multiple punch press below are three of a large number of modern machines installed in this plant. The proper Gulf oils and greases, applied as recommended by an experienced Gulf engineer, protect each machine.

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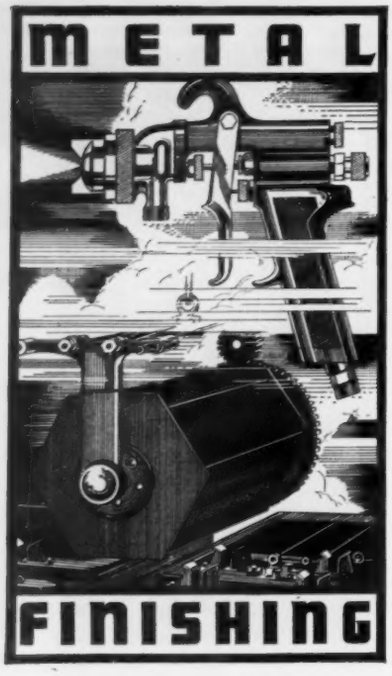


Transportation

Competition and traffic appeal necessitate modern finishes on street cars, buses and trolley coaches. Both internal and external finishes are emphasized at Brill plant

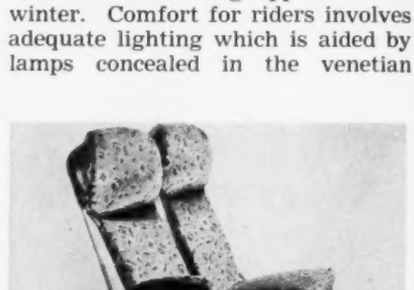
■ MODERN transportation units must not only be fast, comfortable and safe but they must be attractive if they are to prove profitable. This factor of appearance is becoming more important day by day as people come to associate modern "streamline" appearance with modern swiftness and comfort in transportation. Typical of the many advances made in this equipment are those embodied in intercity coaches made by J. G. Brill Co., Philadelphia, Pa.

Modern philosophy of design dictates that things shall be beautiful as well as useful and emphasizes long sweeping curves with elimination of sudden breaks in structural and decorative lines. Also, it is desirable to have door and window openings curved in artistic balance and practically flush with car sides. In addition, color harmony accentuates the whole thing. To the man in the street, this is "streamlining" although it has little or nothing to do with real streamlined design which reduces atmospheric resistance. In Brill coaches, all these factors have received the attention due them.

Frames Mostly Aluminum

Outside surfaces are built over frames principally of aluminum, Alcoa 17-ST. Surfaces where high stresses are encountered use Alcoa 4-S-1/2-H aluminum sheet. For finish sheets and other points where stress requirements are low, Alcoa 3-S-1/2-H is used. Outside surfaces are given a careful Du Lux system finish. Inside finish is mainly Masonite with some sheet aluminum and trimmed-in aluminum moldings. Special attention has been given interior fittings and trim. Sash now embody rounded corners with a sliding feature which makes them neater and easier to clean. Made of stainless steel, they do much to aid appearance.

The venetian blind effect is obtained with formed metal sheet and provides a cool-looking interior in summer and a snug appearance in winter. Comfort for riders involves adequate lighting which is aided by lamps concealed in the venetian blinds. Polished aluminum extrusions are used as corner and longitudinal finish for baggage rack edges and above the venetian blinds. Center ceiling fixtures are Brillites, developed especially for this service. They consist of a die cast zinc alloy grille backed up by an aluminum reflector with Alumilite finish. Using no glass, they provide good light without glare.



Hammock-type seats with polished chromium-plated frames of welded tubular steel

Interior at night showing how finish aids illumination and passenger comfort

Recliner Type Seats

Other modern appointments include luxuriant recliner type seats. These employ a tubular metal frame of welded steel construction which reduced weight of seats about 40 per cent. Use of the hammock principle of upholstery suspension permits the back to take the shape of the person sitting in the seat, assuring maximum comfort. The tubular

Close-up showing daytime beauty of venetian blind effect and polished aluminum trim

steel frames are chromium plated to conform to the modern appearance of the other fittings.

Machine Cleans Steel Corrosion

■ SINCE THE PRESENT trends in practically all fabrication plants include closer specifications and more rigid inspection, amount of steel rejected due to atmospheric corrosion has greatly increased. To reduce this, J. M. Hilbish and J. K. McCahan, Pittsburgh, for some time have been working on a machine which will clean corrosion from warehouse stocks effectively.

The first crude device consisted of an 8-inch pipe in which steel to be cleaned was charged and the whole thing rolled down an incline. Rubbing together of the bars effectively removed rust. This same idea has been refined and incorporated in a machine now about to be placed on the market.

First experimental machine was made with a barrel of 20-inch pipe, 20 feet long, mounted on rollers on a frame and turned by a chain drive. This first machine was completed in the opening weeks of 1936 and was shipped to Cincinnati where it was used in cleaning steel damaged by flood waters. Cost of cleaning was estimated at about $1 a ton on this job. Previous cost of hand cleaning was approximately $5 a ton, using motor-driven brushes, and even higher with hand brushes.

Since that time several refinements have been added and subsequent machines serve a dual purpose. They can be used not only for removal of atmospheric corrosion as described, but also on billets and slabs for cold-finishing operations and on stainless steel for removal of scale, replacing customary pickling and sand-blasting operations. The unit will clean any round, square, flat, hexagon, angle, channel, tee, or concrete bar, and under a patented process will coat the materials with a special compound. Cleaning requires from five minutes to one-half hour, while descaling process requires 1 to 1½ hours.

Plan Larger Units

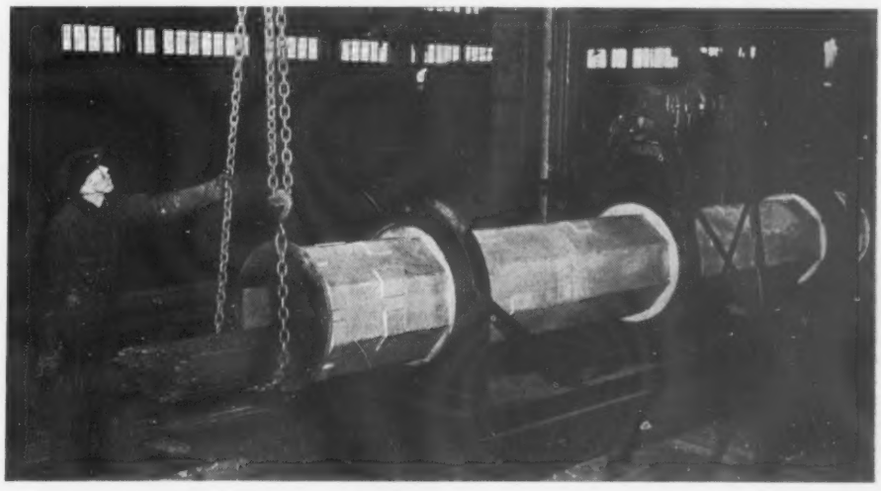
Structural angles up to 8 inches, beams and channels up to 12 inches, and plates of any thickness up to 20 inches wide can be handled in the present machine. Plans are being drawn up for larger machines to handle any length of material under 70 feet. The process is said to improve the surface for welding by removing scale, rust and dirt, and to leave the surface clean enough so enamel or paint may be applied directly.

Barrel of present machine is octagonal in shape and is made of all-welded ⅝-inch plate, is 20 feet long, and is turned by a chain drive from a 20-horsepower motor. It has a capacity of about 4 tons of steel at each charge. Larger machines are expected to take 15 tons at a charge. Barrel is mounted on a fulcrum about one-third of the distance from one end. Opposite end is attached to a drum hoist, which raises or lowers the barrel to facilitate loading and to give longitudinal cleaning action in the descaling process. Weight of the machine is 4500 pounds, not including hoist.

The small unit will clean up to 100 tons of steel daily, depending on the type of job desired, and the larger units are expected to take up to 200 tons. Three of these machines have already been built and have proved highly satisfactory. Patents have been obtained recently on both machine and process, for cleaning as well as for descaling purposes. Compound used also is patented.

Fine coke or blast furnace slag, free from iron, is used both as an abrasive and a cushion for the material in the barrel. This abrasive is saturated either with light oil or a special coating compound, depending on the use for which the steel is intended after cleaning. If steel is to be galvanized or used immediately, light oil is added to the coke abrasive. If the steel is for use at some future time, it is placed in the barrel with sawdust saturated with a coating compound. Slag is used as an abrasive when the steel is deeply pitted.

The machine also will clean pipe between 1 and 10 inches in diameter, both inside and out.



Steel is cleaned quickly in this efficient machine and can be painted without additional work

New Aluminum Finish

■ Known as Aluminum Synthetic No. 66-656, a new air-drying finishing material has been made available by Stanley Chemical Co., East Berlin, Conn. Application is by spraying or dipping. Adhesion and weathering ability are claimed for it as well as a bright, smooth finish free from sags, runs and drip.

New Colored Lacquer Has Pearly Metallic Sheen

■ Trans-lux metallic colored lacquer is a recent development of Hilo Varnish Corp., 60 Stewart avenue, Brooklyn, N. Y. It is a durable, highly pigmented flexible lacquer that withstands normal outside exposure.

It may be used as either a decorative or protective coating on any nonporous surface such as towel racks, toys, automobile accessories, novelties, and switch-plates, etc. It is made in many colors and readily adheres to steel, brass, tin, copper and polished aluminum. On nickel or chromium, better adhesion is produced when a coat of clear synthetic baking primer is first applied. Best results are obtained by spraying mist coats at high pressure, 60 to 70 pounds, until solid hiding results.

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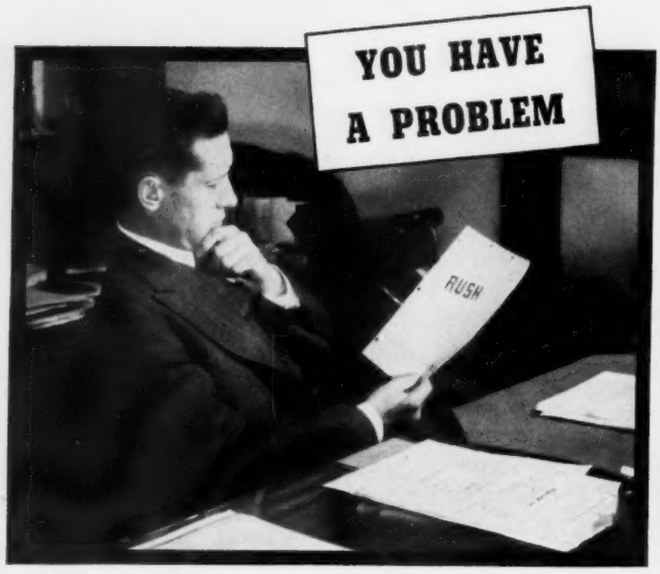

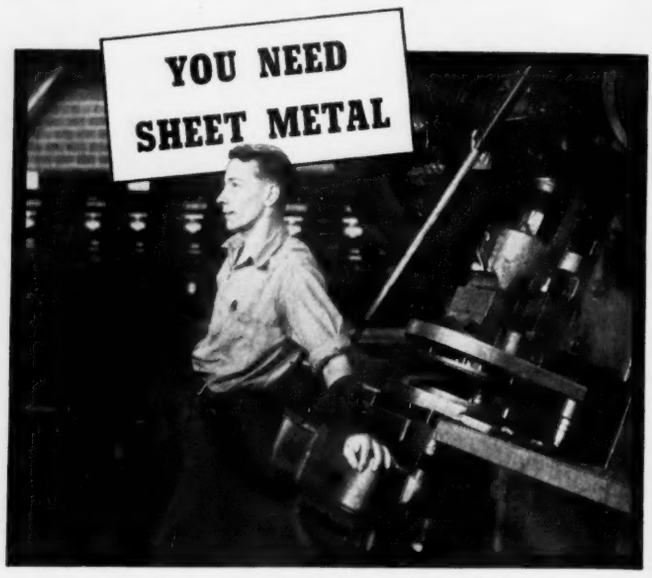

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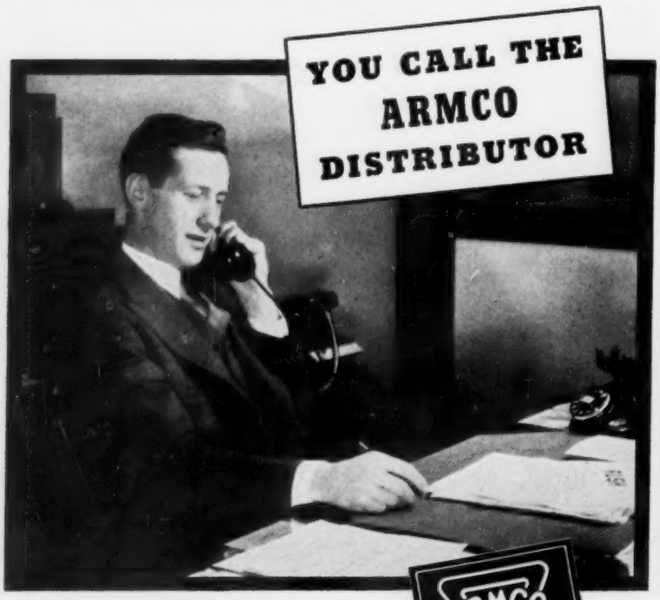

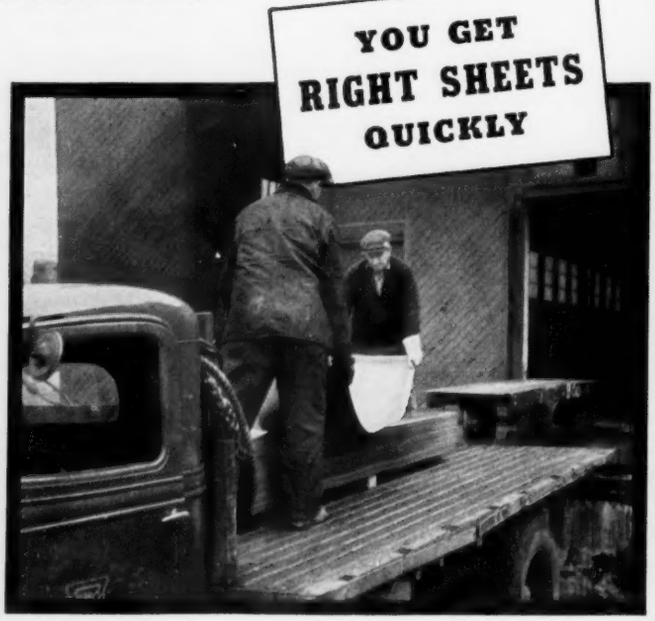

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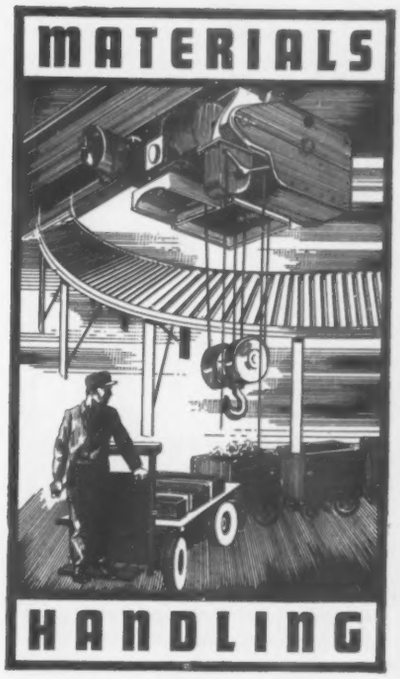


Plant Layout

Provision for strategically located cranes, conveyors, lift trucks and other equipment in original design of automobile plant well repaid in smooth movement of large tonnage

J. A. CRONIN, Materials Handling Editor

■ LAST YEAR, Pontiac Motor division of General Motors Corp., Pontiac, Mich., used approximately 380,000 tons of materials to produce 736,000 cars. Handling of such large tonnages is a task and one that becomes of increasing importance when considered in relation to operations as a whole. Receipt and distribution of hundreds and hundreds of items entering into a production schedule has been met in an interesting manner, and efficient handling has been established as a major factor in keeping down production costs.

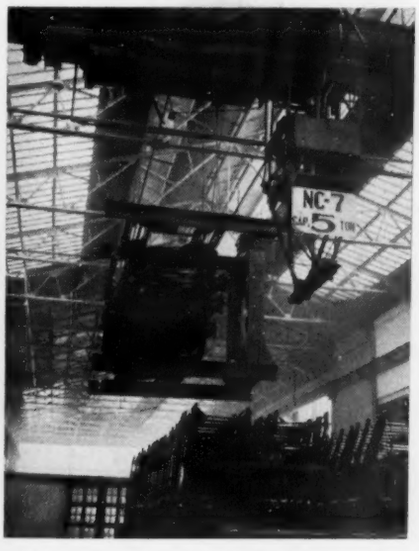
While conveyors are common equipment, it is claimed that in the case of overhead units probably few automobile plants handle as large a volume of materials and parts with as small an installation as does Pontiac. This economical operation was made possible by careful consideration of layout at the time the plant was built a decade ago. Incidentally, the Pontiac establishment is a complete manufacturing unit, an efficient one, and much of this efficiency has been attributed to the effective manner in which materials are transported.

There is no attempt to rely upon any single class of equipment. In addition to approximately seven miles of overhead conveyors, 99 power-driven industrial trucks and tractors and 13 overhead traveling cranes are utilized.

Maintenance of this equipment comes directly under the plant engineer, while its operation is a function of the materials department where a clerical staff works in conjunction with the purchasing department in scheduling receipt and movement of all incoming materials and parts. However, interdepartmental trucking and conveying of parts and materials in process comes under the jurisdiction of material supervisors.

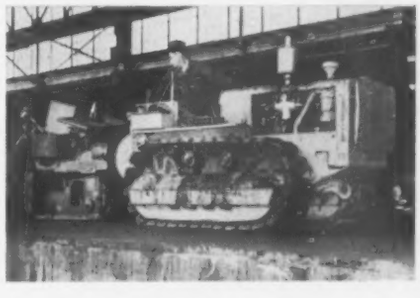
All railway and highway truck docks are located under cover within the plant so there is no outdoor unloading or loading. This is one of many provisions which resulted from planning the original layout.

Another planned feature is a plentiful supply of cranes. There are 13 of these overhead traveling units allocated as follows: Two to handle pig iron, scrap iron and scrap steel; two to handle sand in the core department; one located over incoming railroad tracks in the motor department to take care of incoming heavy materials; one between the motor and assembly departments and over railroad tracks to handle incoming materials for the axle and car assembly; one operating over the full length of the assembly unit, keeping stocks of parts replen-



One of 13 overhead cranes in Pontiac plant unloading chassis frames from railroad gondolas, using a special cradle designed for this work

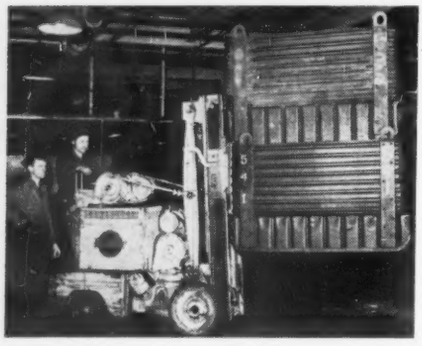
Tractor and trailer towing incoming material from freight cars to receiving department. Freight cars are all unloaded under cover



Tractors are used to move heavy machinery and haul loads which cannot be handled by smaller industrial trucks

ished at all stations; two, with special equipment, between assembly and sheet metal departments for unloading and storing chassis frames received in gondola cars; one in the die department; one in export shipping; and two for unloading incoming steel for the sheet metal plant.

Efficiently placed overhead conveyors move steadily through many departments. Of the total of more than 36,000 feet of overhead, production assembly line and miscellaneous conveyors, approximately 20,000 feet is in the final assembly lines, or terminates in the final assembly department. The longest single overhead line is 2500 feet. It carries fenders from stamping department to sheet metal storage on the mezzanine of the car assembly plant. The second longest, 1900 feet, transports hoods and radiator shells from stamping to paint department. Six other overhead conveyors in the car assembly department each exceed 1000 feet in length. The final assembly line itself is 1250 feet long, and there are 1360 feet of production assembly conveyors in final inspection and finish lines.



A fork-type 3-ton capacity industrial truck used for conveying tote boxes or gondolas of small parts from one department to another

Foundry uses more than 9000 feet of conveyors, 4500 feet of which is overhead and 3300 is on production assembly line work where molding, casting and cooling take place. Motor plant employs 2125 feet of overhead and 500 feet of assembly line conveyors. The axle plant contains 2765 feet of overhead and 135 feet of assembly line conveyors.

Roller tables are used to move heavy parts, such as cylinder blocks, over short distances between adjoining machining operations. Motor and final chassis and car assembly lines are heavy, endless chain conveyors. Parts too small or too unshapely to be handled by mechanical conveyors are loaded into trucks, skids, racks or trailer, and picked up by lift trucks or attached to tractors.

To service the 99 industrial trucks and tractors, a garage is maintained in the plant. These machines are predominantly storage-battery and gas-electric units and vary from three to 20 tons in capacity. All trucks, tractor and trailer units are rubber-tired. Truck equipment includes low-lift, high-lift, fork, platform tractor, charging type and caterpillar tractor units.

Each plant, as well as each department, has its definite assignment of trucks. Car assembly heads the list with 24 units in daily use. Next is the foundry with 20. Then, in the following order, are the sheet metal stamping department with 18; motor department, 15; maintenance, 14; central stores and service parts, three each; and by-products and service manufacturing, one each.

Besides the truck equipment, there are 300 box trucks, 300 skid platforms, 600 trailers for use with tractors; 100 sand hoppers and 200 special racks for cores.

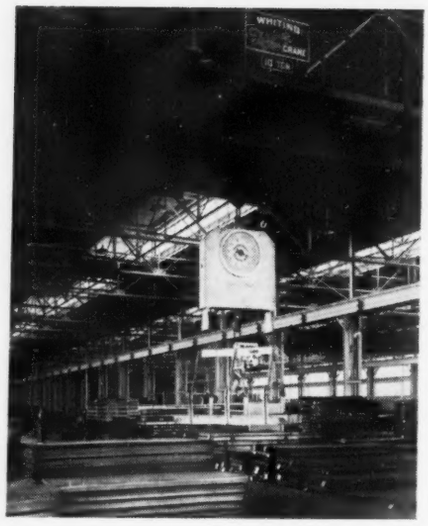


Fig. 1—Interior of Central Steel & Wire Co. warehouse, Chicago. Here a 10-ton crane is equipped with automatic dial scale and lifter for handling sheet

Automatic Crane Scales Speed Warehouse Work

■ Throughout the large new warehouse of Central Steel & Wire Co., Chicago, building, design, layout of storage areas, and provision for equipment all indicate that here is a structure built around its materials handling system. With total floor space of approximately 180,000 square feet, the building houses an abundance of cranes, scales, lifters, floor trucks and other items of equipment for the rapid receipt, storage and shipment of bars, sheets, wire and tubular forms and shapes. Building contains three bays, each 600 feet long by 100 feet wide. In each bay are two overhead electric traveling cranes. Fig. 1 shows one of these, a 10-ton unit. This particular crane is equipped with both a dial scale and a mechanical sheet lifter. Thus, it provides means for easy handling of heavy loads of sheets and at the same time it weighs loads while enroute to storage or to shipping platform.

There are two overhead crane dial scales in the warehouse, one a 10,000-pound and the other a 20,000-pound capacity unit. These are used to weigh materials received and also heavier pieces prior to their shipment. When a load suspended from the scale is lifted by the crane, an operator on the floor pushes a button switch on the hanging cable, and after the dial indicator comes to rest, the printing mechanism in the scale automatically records the weight on a ticket and then ejects the latter from the side of the scale.

In addition to these two large crane scales, the warehouse is equipped with eleven other dial scales, each with the automatic printing and recording device. Six of these are 10,000-pound capacity built-in units. These are located strategically at various points and are used mainly for weighing materials which are transported on

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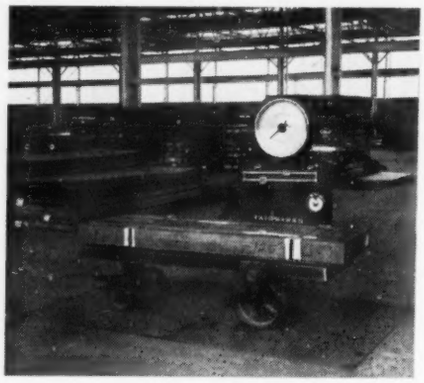
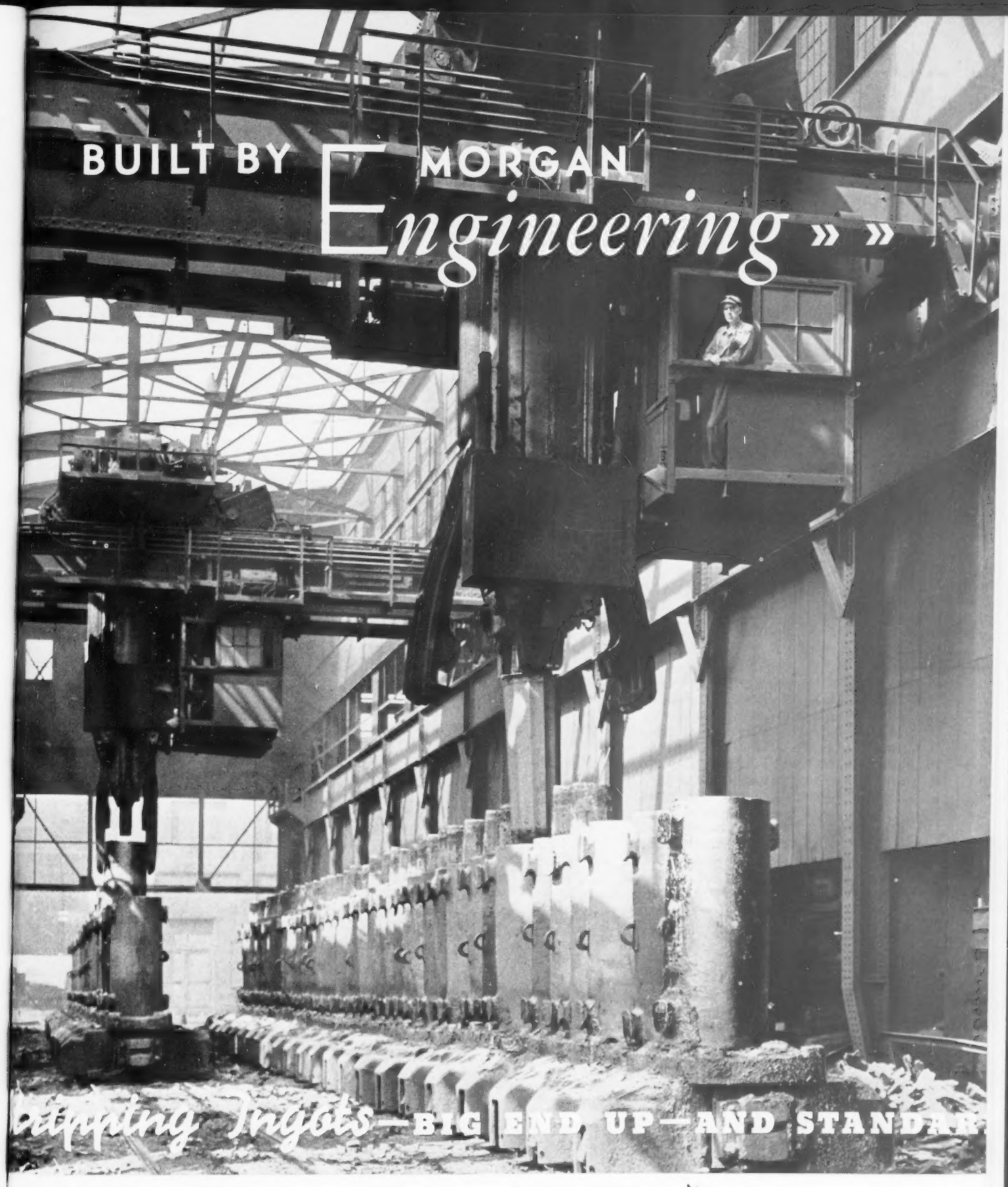


Fig. 2—One of six built-in scales of 10,000-pound capacity located at strategic points throughout warehouse. Floor trucks transport shipments not requiring crane service



★

• Two of the Morgan 150-ton, 73′6″ span, screw type Ingot Strippers at work stripping standard and big-end-up ingots in a northern Ohio mill. Efficient, rugged, dependable—such huge machines play an important part in stepping up steel production to meet demands of the blooming mills. Morgan Engineering has designed and developed strippers to perform three distinct stripping operations without making changes in the stripping unit. Today this machine is designed to (1) strip small-end-up or standard ingots; (2) strip big-end-up ingots; (3) break small-end-up ingots loose from stools. Faster, more easily controlled than older machines but built to the same high standards of Morgan Engineering integrity.

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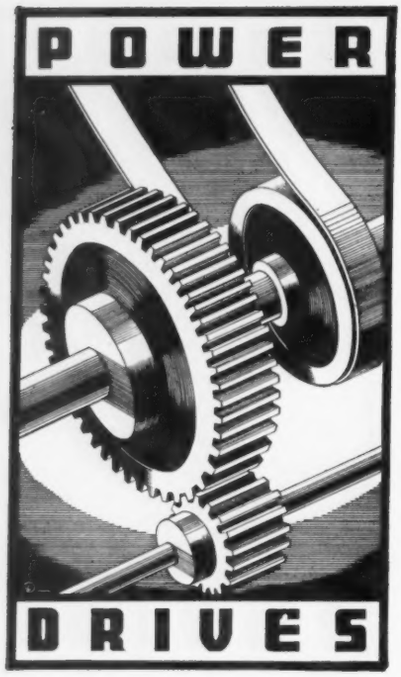


Drive Superstructure

An engineered method of installing drive and shafting supports in conjunction with carefully planned group drive system cuts first costs as well as annual fixed charges

By **ELMER J. PRATT**
Engineer
The Dole Valve Co.
Chicago

■ RECENT expansion of Dole Valve Co. plant in Chicago necessitated construction of a new 3-story and basement reinforced concrete building. Careful and thorough investigations were made to determine type of machine drive and method of installation. The product consists largely of special types of thermostatic radiator valves to control temperatures in houses and offices, automobile thermostats and automotive specialties. The new addition will house hand and automatic screw machines, hand millers and numerous special machines. Practically all of the production is on relatively small parts.

This plant operates at maximum, feeds and speeds and in some cases above what is ordinarily considered maximum. Therefore, the selection of the proper drive for the new installation required careful consideration. The plant had been operating with a combination of group and individual drives. If a changeover to all-individual drive was to be made, the logical time to make it would be during the move.

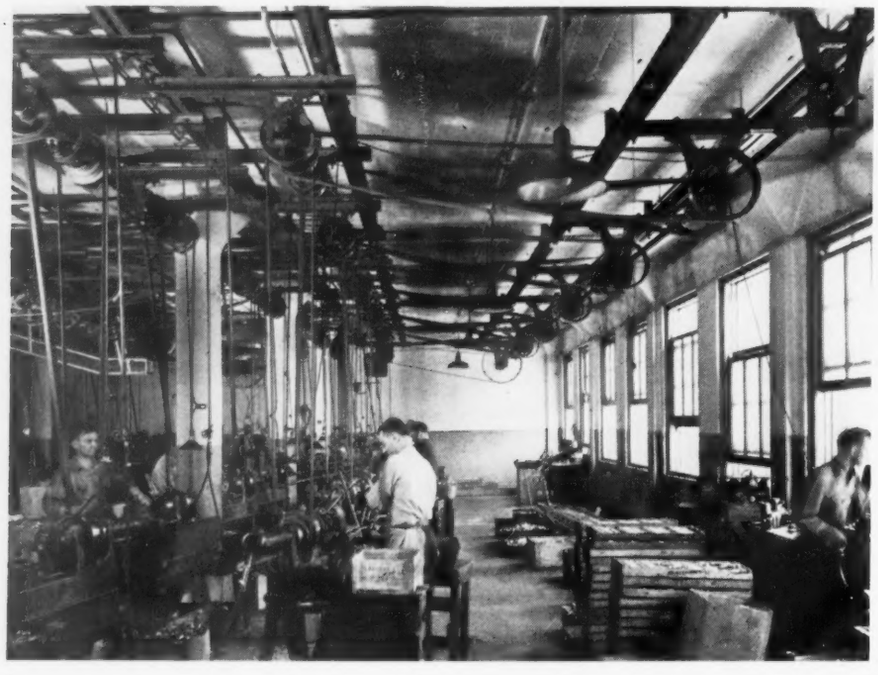
Individual drive was seriously considered because of its clean cut appearance, maximum light and flexibility obtained. A careful study of the load on a hand screw machine indicated an irregular load with peaks at time of starting cuts, light demand through operations and no load while shifting turret tools and inserting new work. Such irregular demand results in a very low average load factor and an exceptionally low power factor.

Further investigation indicated that modern group drive for most of the machines would provide a much better load factor, an average of about 75 per cent of full load. One of the most important advantages was the saving in installation cost.

To have adopted individual drives would have necessitated constructing or purchasing special brackets or mountings for the motors on all existing machines. Such mountings cost from $50 to $100 per machine, not including cost of motor and individual wiring and starting equipment. We finally decided to drive most machines in relatively small groups.

Advantages Illustrated

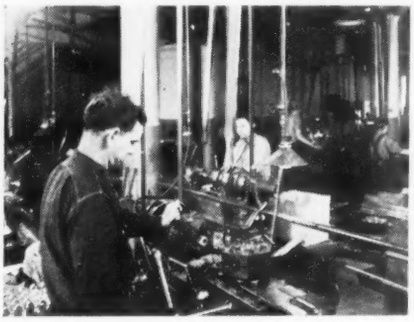
Advantages of this method are well illustrated in connection with a group of six No. 2 Warner & Swasey hand-screw machines. If individually motorized each would require a 3-horsepower motor to take care of starting and peak load requirements or a total of 18 horsepower in motors for the six machines. By grouping and driving from a lineshaft, the six machines are powered by a 7½-horsepower motor which costs less than would two 3-horsepower motors, thus sav-



Placing lineshaft in the center of a bay and driving both ways to rows of machines along the columns leaves ample floor space for trucking

ing the cost of four 3-horsepower motors. Comparable savings were made in individual wiring and control equipment for the one motor in contrast to distributing power to six motors.

Groups are kept small, in most cases consisting of five or six machines driven by a 7½-horsepower motor. One larger group of 10 ma-



Machines are placed back-to-back along the columns with drops for air and other service lines between to serve both rows

chines is driven by a 10-horsepower motor.

Cost of lineshaft installed is practically the same as adapting the machines to individual drive, not including cost of motors and wiring. Therefore, differences in motors and wiring costs are a direct saving in first cost. As annual fixed charges average from 10 to 15 per cent of first or installed cost, any saving on original installation costs results in lower yearly expense. Thus savings in first cost result in lowered original investment and a corresponding reduction in annual fixed charges, especially desirable under present conditions.

In Large Groups

In the former arrangement machines were in fairly large groups driven by two 20-horsepower motors and one 10-horsepower motor. However, only part of the equipment was operated on the extra shift so that many machines ran idle and the motors operated underloaded.

In the new layout, smaller groups are used and work is processed on two shifts and arranged so that a group either is operating at full load or is idle. This saves power, gives a better motor load factor and approximates a satisfactory power factor. although no power factor penalty clause is included in the contract for electrical power.

Careful tests on power consumption of the former groupings provided the basis for estimating the power requirements for each present group. This estimate included reduction in friction load by changing to dumbbell-type tapered roller bearings on the lineshaft. With reinforced concrete building construction there should be no losses from misalignment. Also, antifriction bearings require lubrication only twice per year, reducing the labor and cost of servicing.

All of this had been planned before the building was erected, so ceiling inserts were set in the concrete for easily and quickly attaching the lineshaft superstructure. These inserts are spaced on 3-foot centers instead of on 4 or 6-foot centers, as is commonly done. The closer spacing permits mounting motor or countershafts with shorter sections of steel than if longer centers had been used as mounting across three inserts is never longer than a 6-foot span compared with 12 feet on 6-foot insert centers.

Superstructure for mounting the 4-point adjustable drophangers is constructed entirely of steel channels. Stringers consist of two pairs of 5-inch channels which are bolted together back-to-back with ½-inch square-head machine bolts with 1-inch steel spacers between. These stringers are bolted to alternate ceiling inserts or on 6-foot centers. Footings for shafthangers consist of a similar pair of 3-inch channels bolted together with 1-inch spacers.

Hangers are spaced about 8 feet apart where they will best support the load. In erecting, superstructure stringers were first bolted in position with a 7-inch length of 3-inch pipe which rests on the top of the channels and acts as a spacer to drop the stringers below the ceiling. A 4-inch cast-iron adaptor with a shoulder which fits into the pipe spacer rests on the channels and centers pipe on bolt.

Where necessary to attach stringers to the plates above building columns, a 4-inch length of pipe is used. These pipe spacers drop the bottom of hanger footings 15¼ inches below the ceiling so that superstructure and belts clear sprinkler pipes, conduits, steam pipes and any other lines extending along the ceiling.

Placed Back-to-Back

Most of the groups are laid out so lineshafts extend down center of the 24-foot bays. Two lines of machines are driven off of this lineshaft, thus placing two rows of machines back-to-back along each line of columns. This provides ample trucking and material space between rows of machines without column obstruction.

Drops from the overhead airlines extend down to service the two lines of machines. Sufficient space is left between machines for cleaning floor or servicing the machines. All screw machines are set at an angle of 12½ degrees for rod or bar feed. This requires a vertical drop of drive belt to cone pulley because of the angular drive.

Space directly in front of windows is reserved for inspection or bench work and in one case for a row of individually driven special machines. Countershafts are mounted on superstructure similar to that for mounting the lineshaft except that three parallel stringers on 3-foot centers take care of the footings for countershafts on the two

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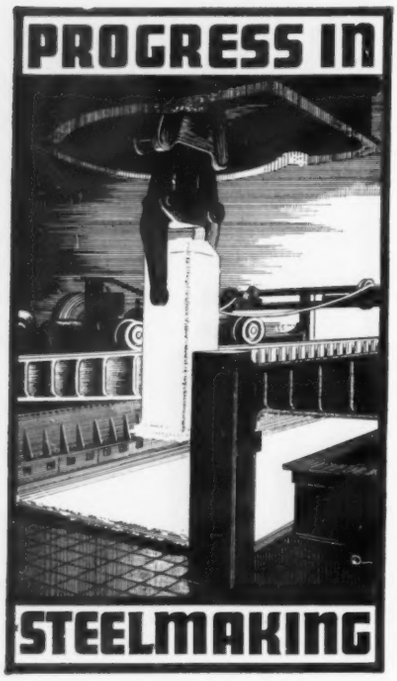
Ceiling inserts on 3-foot centers simplify erection of steel superstructure for lineshafts and countershafts. Photo courtesy Dodge Mfg. Corp., Mishawaka, Ind.



Emphasizes Safety

Many innovations in building design, equipment and controls, combined with complete mechanical-electrical safeguards, afford utmost protection to workers in new mill

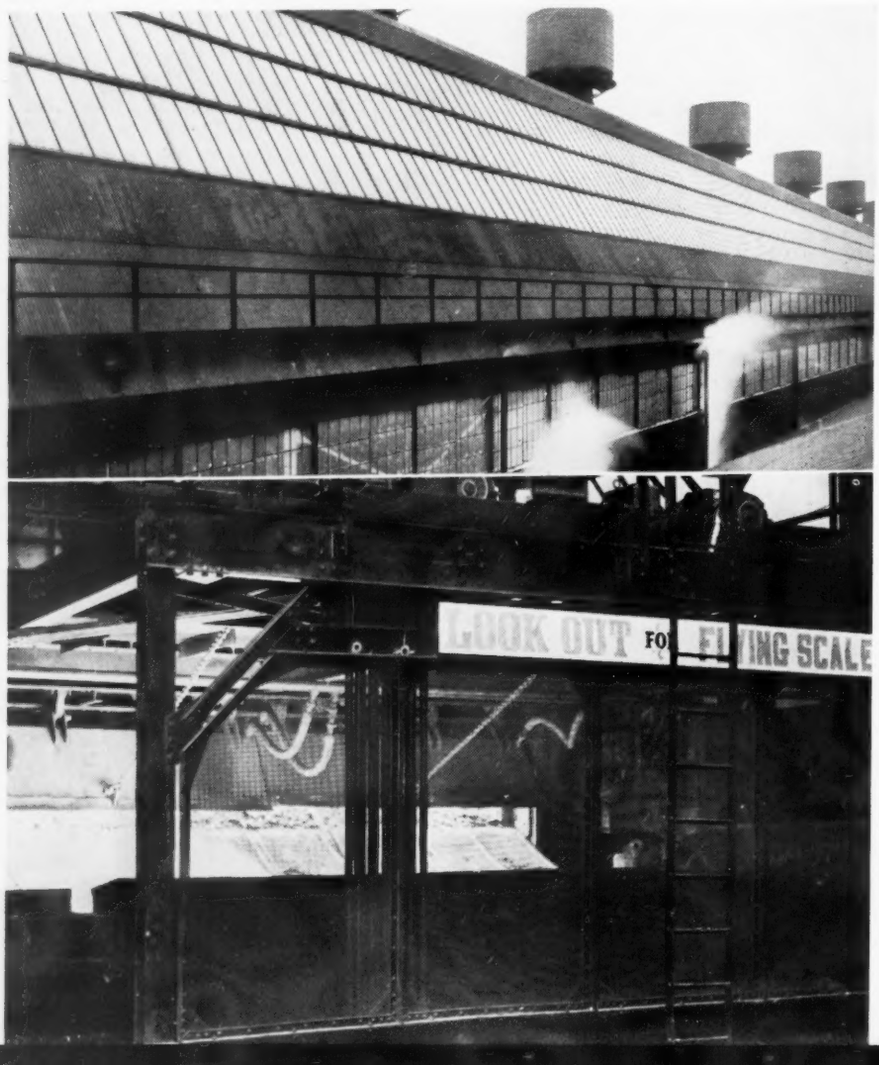
■ THAT SAFETY pays dividends has been proved time and again in the plants of the Jones & Laughlin Steel Corp. since the inauguration, in 1926, of a separate department devoted to safety engineering. When the recently completed 96-inch continuous strip mill at the Pittsburgh works of this company was in the design stage the safety factor received detailed consideration.

Safety engineers worked side by side with designers in drawing plans for the mill to insure that buildings would be safe, mechanical and electrical equipment would be well guarded and general layout would facilitate mill operation and handling of material in safest possible manner.

Several unique safety features were incorporated. The strip mill consists of 12 buildings grouped together as one unit which extends for about a half mile along the Monongahela river to cover more than 23 acres. Buildings are sawtooth type with windows on the high side facing north for best possible daylight. To clean these windows from the inside, metal walkways with railings are provided extending the length of each building. Access to these and all overhead walkways is by stairs rather than fixed or temporary ladders. Stairs and walkways also provide access to roofs and gutters on outside of buildings as shown in an accompanying illustration.

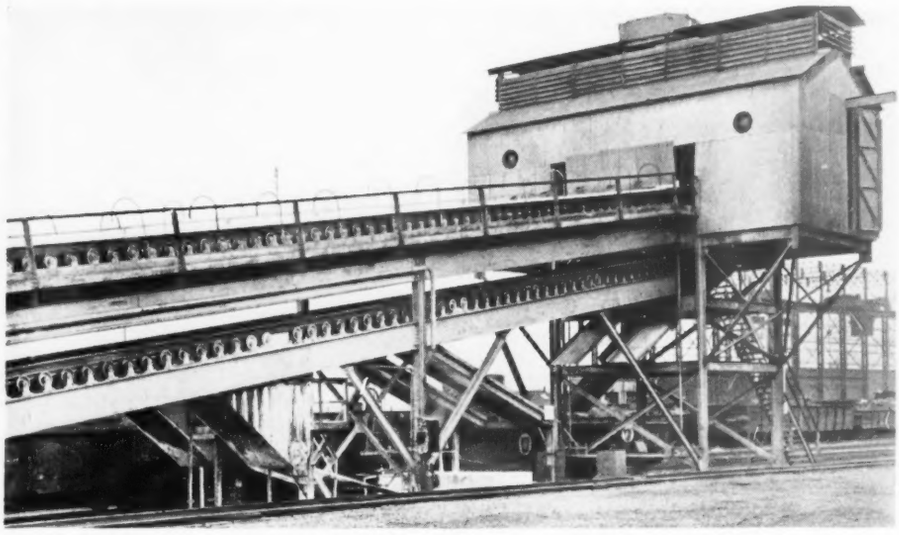
Proper Lights Provided

Good lighting is not only conducive to safety, but is an incentive to production of high quality material. In addition to large window areas mentioned, careful consideration was given to the artificial lighting requirements in the various departments. Average amount of light in hot mill finishing department



Top. Stairs and railed walkways provide safe access to roofs and gutters. Similar construction inside permits safe cleaning of windows. Below. Heavy steel screens protect workmen from flying scale at delivery end of slab heating furnaces shown and also at scale breaker and first roughing stand

THE STATIONARY WHEEL PIG CASTING MACHINE



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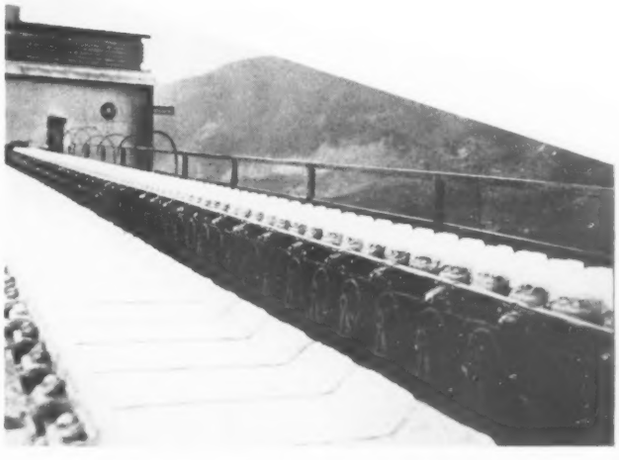
All sizes of pigs can be cast by changing the moulds only.

No vibration in machine — resulting in better grain structure in pigs.

THE STATIONARY WHEEL DESIGN GIVES THE OPERATOR THE LOWEST PIG CASTING COSTS



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PITTSBURGH *ENGINEERS* PENNA. U.S.A.

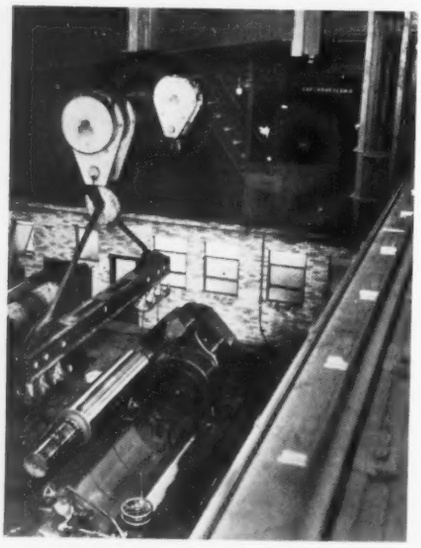
amounts to 12.5 foot candles; plate finishing and shears, 12.2 foot candles; blue annealing, 8.0; slab yard chipping, 30.0; roll shop, 9.5; cold rolling, 10.8; cold mill finishing, 12.0; and cold mill shipping, 9.1. Special supplementary lighting is provided for certain finishing operations and inspection stations.

Overhead electric cranes have always constituted a serious safety hazard and special attention was given this problem. In the past, many workmen have been permanently injured or killed when caught between the trucks of moving cranes and building columns. Safety engineers eliminated this hazard here by providing a minimum clearance of 15 inches between the end trucks and the face of building columns. Although this added $40,000 to the cost of the building, it is considered money well spent because of the additional measure of safety it provided.

Extra Brakes on Cranes

Characteristic of all strip mills, overhead electric cranes are used here to transport loads weighing as much as 75 tons for distances of several hundred feet. Heretofore, many loads have fallen because of failure of brakes on the motor shaft. Upon recommendation of the safety engineers, all cranes in this mill have an extra set of brakes installed on the jack shafts providing additional protection to equipment and workmen.

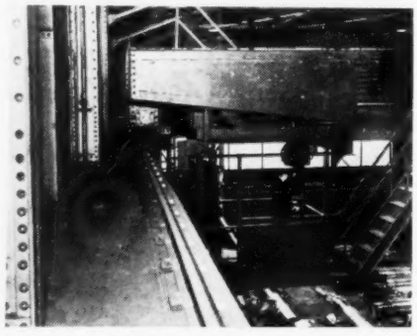
For protection of crane operators, red and green signal lights have been installed outside each crane cab. When craneman is in cab operating crane, the green light burns. When he leaves the cab for any reason, the main circuit switch in the cab is locked out and the red light switched on. This red light warns other crane operators that the crane should not be bumped or moved without first ascertaining the whereabouts of the operator. In addition to this safety measure, all crane access platforms are reached by stairways. Full-length railed-bridge walks, the floors of which are checkered plate, have been provided on each side of all cranes.



Failure of motor brakes to hold load has resulted in injury to workmen and damage to equipment. Here an extra set of brakes on jackshafts prevents such accidents

Control Voltage Low

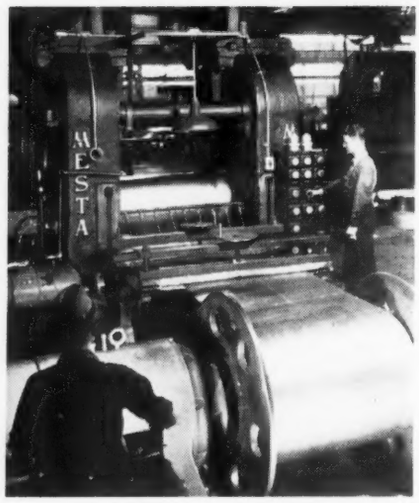
In the effort to have all mechanical and electrical equipment as accident-proof as possible, considerable money has been expended for the installation of safeguards and safety devices throughout the mill. Electrical equipment in the mill is the most modern available, all hazards having been carefuliy considered by the electrical and safety engineers before purchase of any equipment. Thus, while practically all equipment in the mill is electrically operated, no high voltage is exposed to the average employe anywhere in the entire mill. Wherever manual control is necessary in 440-volt circuits, control transformers are installed to reduce the circuit to 220 volts at the pushbuttons. Also, when repairs are necessary, circuits are arranged so each can be locked open.



It cost an extra $40,000 to provide the 15-inch clearance shown between crane trucks and building columns. All crane platforms are reached by railed stairways and bridge walks

All power transformers and starting reactors are insulated by a noninflammable liquid instead of oil. This eliminates a fire hazard and makes for safer operation. Towers which support electric cables coming from the power plant have been designed with a partition in the center, making it possible for electricians to work on the dead side of the line without coming in contact with the live circuits.

Mechanical guarding in this mill is developed to a high degree of efficiency, there being no moving parts exposed where an employe might be injured unless he violates regulations and deliberately places himself in a hazardous position. On roll housings in the hot mill, pipes to the descaling sprays, operated at 1200 pounds per square inch pressure, are shielded to protect employes in case of failure of the pipes.



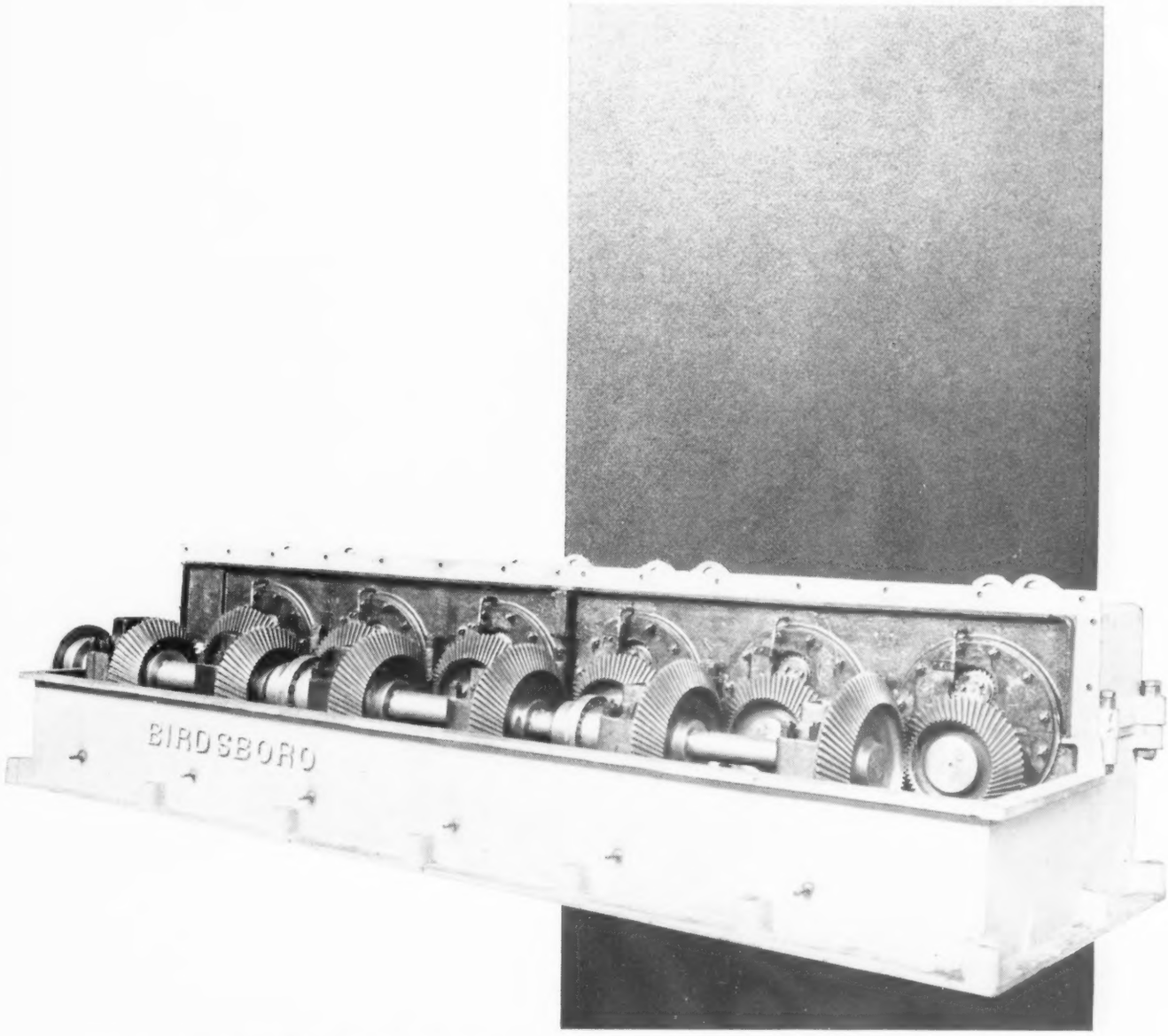
Control transformers provide low voltage at all push button stations such as at temper mill above. Operators thus are never exposed to high voltages

Stop Flying Scale

Heavy steel screens have been erected at delivery side of slab heating furnaces, at scale breakers and at the first roughing stand to protect employes from flying scale when a slab slides from the furnace or starts through the rolls. The usual guards on all drive units from motors to roll housings have been provided. Well lighted subways under roll tables make it unnecessary for employes to cross moving machinery, thus preventing possible accidents. Clean, airy rooms with adequate washing, bathing and toilet facilities are provided at convenient intervals throughout the mill.

Realizing that mechanical safeguards, careful planning and expensive safety equipment are not enough if workmen themselves are not safety conscious, the company continues its program of safety education through safety discussion classes with the foremen and use of conspicuous signs, posters and bulletin boards.

In addition the company also holds safety meetings of employes, sponsors safety contests, distributes a safety leaflet from time to time and supplies workmen with printed safety rules applicable to their particular jobs in the never-ending effort to emphasize the importance of safety.



IT DELIVERS A MILE OF ROD

Every 90 Seconds

This Finishing Mill Drive for a semi-continuous 10″ Rod Mill designed by Birdsboro engineers combines Pinion and Drive in a single housing. This compact design allows direct connection to roll stand, saves floor space and speeds production of finished rod.

Roller bearing equipped throughout, the gear ratio steps up from 727 RPM at the intake to 1227 RPM at the delivery, sending out finished No. 5 rod at a speed of approximately 3600 feet per minute. A pressure lubrication system cools and re-circulates the lubricant. This installation again demonstrates Birdsboro's ability to design mill equipment to meet the specific requirements of the job.

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Fabricating Stokers

Several unusual jig and fixture designs are utilized here to facilitate sheet metal welding. Shielded-arc, carbon-arc and oxyacetylene methods are employed

■ STOKERS built by Will-Burt Co., Orrville, O., include much welded construction as all sheet metal parts and even some castings are welded. Early experience with welded construction indicated that special jigs and fixtures were not only necessary to facilitate this work but that realization of the full economies possible with welded construction largely depended upon the efficiency of this equipment. Results obtained in higher production and a better product were considered well worth the development expense involved.

A fixture which has proved especially valuable is shown in Fig. 4. It is used in making the irregularly shaped hoppers from which coal flows through feed tubes to the furnace. Fig. 1 shows this hopper, the apron covering the power unit, the fan housing and the air ducts leading up to the burner pot—all made from welded sheet steel. Design of hopper fixture was the most difficult due to its irregular shape and necessity to provide for removal of the completely closed product as well as to reduce distortion to a minimum. Final design includes speed clamps, allows for removal, furnishes heavy backing sections for the top welds and permits complete positioning of the work.

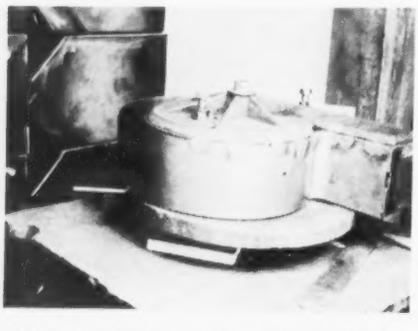

Fig. 1—Stoker with welded sheet metal hopper, fan housing and air ducts

Fig. 4 shows under side of this fixture with three sides of the hopper inserted and the fourth side removed to reveal fixture details. Diagonal corner welds at top of hopper unit are made using heavy coated welding rods, Clamps hold metal accurately in position. Clamps are made of heavy sections to conduct heat away from surrounding metal thus avoiding distortion.

Bolts Locked Tight

A unique method of clamping is utilized here to speed up operation of the fixture. Loose bolts with heads shaped to clear slots in the lower section of the clamp extend up through the upper clamp section and are locked tight by a nut with a welded on handle for fast manipulation. A second nut is welded to the top of the bolt to limit range through which lower nut may operate.

In use, sections of the hopper are placed in position in the fixture and the lower clamp section, which is hinged, swung up into place. Turning handle on operating nut rotates bolt so head falls through slot. Further rotation of bolt brings its head crosswise slot against a pin which holds it in this position. Further rotation of operating nut draws clamp sections together, tightly clamping hopper sections. Other hopper sections are fastened in place in a similar manner.

After welding is completed, handle of operating nut is turned to unscrew nut, loosening clamps. Further rotation of operating nut brings it against welded nut at top of bolt which causes bolt to turn, permitting head of bolt to turn into slot in lower clamp which results in clamp dropping open. Fig. 4 shows clamp for upper left corner in the release position.

After clamping hopper sections in fixture, welding procedure involves making top joints with the shielded arc using about 100 amperes direct current as this material is 12 or 14-gage, hot-rolled steel sheet. Filler metal is applied only to joints at top. Other joints are made with the carbon arc at about 40 volts, 80 to 100 amperes direct current, after first being tack welded at several points to assure proper positioning and to reduce warpage.

Clamping fixture is mounted for rotation and tipping to any position desired. This permits all welds to be made in a horizontal position aiding maximum speed and insuring quality welds.

Another fixture especially made to handle work in this plant is shown in Fig. 5. This is a semiautomatic device used in welding air tubes and long housings which are made from 16-gage, hot-rolled, steel sheet. These involve longitudinal seams of considerable length so that some sort of semiautomatic fixture is highly desirable. The machine now used consists of a long narrow table carrying a frame mounted on rollers. This frame accommodates various

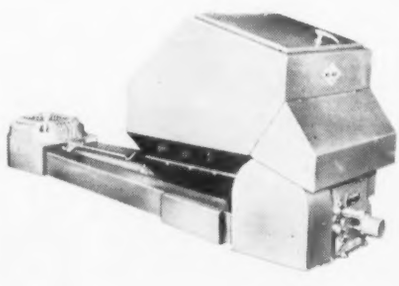

Fig. 2—Fixture used in gas welding fan housings

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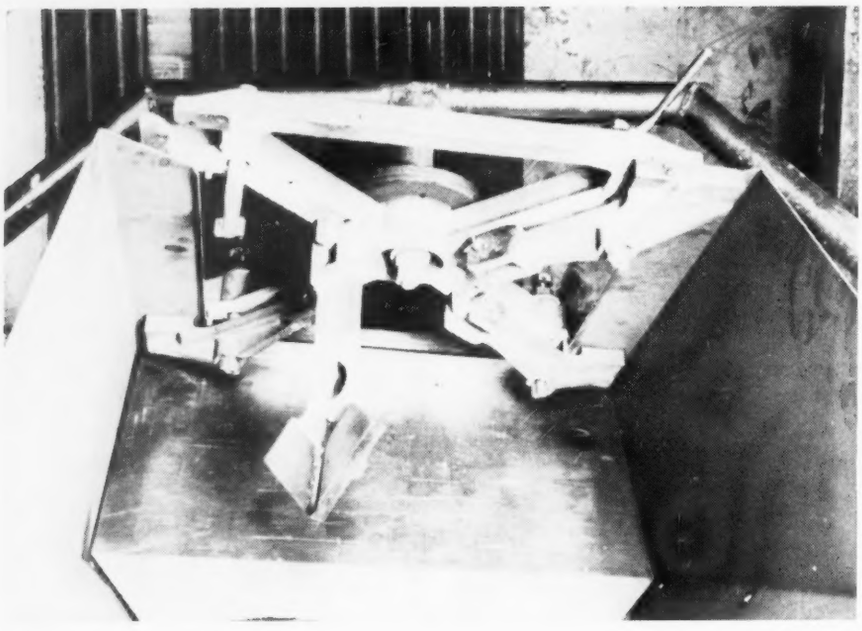


Fig. 3—Sheet steel bottoms are welded onto cast iron fire pots as shown here

trough-like jigs in which the tube sections are clamped. Dual rollers ride on top of the tube sections and are arranged near the operator's station to force the edges of the section together. The movable frame is driven by a motor through a clutch and speed reducing mechanism at the right end of the equipment. Several speeds are available.

In operation, the welder places the jig for the particular work at hand on the movable frame, clamps housing sections in place, starts joint and welds a few inches so that top rollers can be placed in position. Then the table drive is started. The clutch is controlled by a knee lever at the operator's station. After striking the arc, clutch is engaged to move work past operator who merely maintains the arc. This arrangement has been found a great aid in speeding up this work and in assuring better and more uniform joints.

Welding blower housings involved solution of a distortion problem as welds has a strong tendency to bend the side of the housing out of shape. The fixture shown in Fig. 2, however, now welds these parts with little distortion. It consists of a heavy circular casting with a heavy top plate between which the flat side of the housing is clamped. Enclosing section of housing is positioned by a series of tack welds started along the short flat section at the extreme right in the illustration which shows housing with a portion of these tack welds applied. Subsequently the continuous joint is made. Of course, only one side of the housing is involved here as the other is open towards the blower. All these joints and tack welds are made with an oxyacetylene torch without filler metal. Material is 16-gage, hot-rolled steel sheet.

An interesting application of welding is seen in Fig. 3 where a 12-gage sheet steel plate is welded to the bottom of the cast iron burner pot to seal the air chamber. Formerly these were fastened to the casting by hardened steel drive screws but now a 1½ or 2-inch bead is run at intervals around the edge and has been found highly satisfactory with no defects developing in shipments, installation or use.

Although welded steel construction has been considered for the automotive type gear box in the power feed unit, an iron casting is being used at present. Hopper bases and burner pots likewise are made of cast iron.

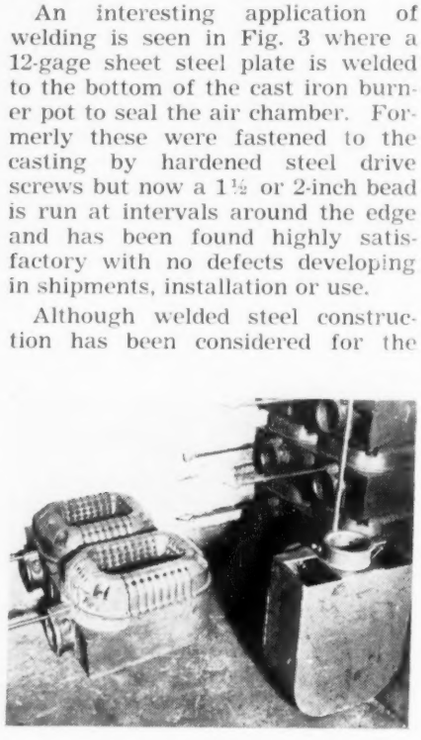
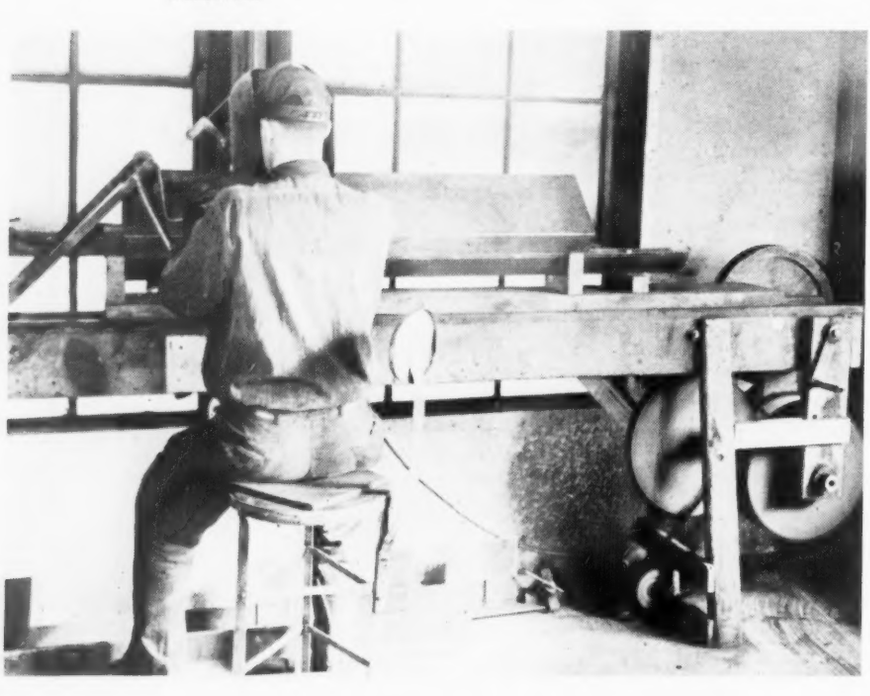


Fig. 4—Closeup of fixture used to clamp sections of hopper while arc welding. Bottom sections of clamps serve as backup plates when making top corner welds

Fig. 5—Semiautomatic fixture for welding air ducts. Extra trough-like jigs are seen on floor under machine



Welding Rods Protected

■ Users of heavily coated welding electrodes have often found considerable moisture is picked up by electrodes during storage. Sodium silicate, present as a binder in electrode coatings, has a natural affinity for water and therefore easily absorbs moisture from the air, hampering adhesive qualities of the coating with resultant spalling off. As an answer to this problem, Harnischfeger Corp., 4400 West National avenue, Milwaukee, is introducing new vacuum-packed rectangular cans for Smoothare welding electrodes. Rod from drying ovens at end of production line is placed immediately in the new containers and tops hermetically sealed. A key is used to open the cans.

Drive Superstructure

(*Concluded from Page* 55)

rows of machines set back-to-back.

Not all machines are group driven. On one floor a battery of small automatic high-speed screw machines, rebuilt to incorporate special features, are driven individually. These are set parallel and at an angle of 15 degrees from a right angle to the wall. This slight angle to the windows gives better natural light at the machine as well as permitting installing more machines in front of the window than if they were parallel to the wall. These machines operate irregularly through the year, at high speed and, therefore, are individually driven by 1-horsepower motors.

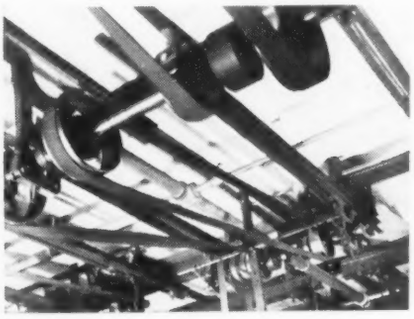
Lineshafts are driven at 290 revolutions per minute from 7½-horsepower, 220-volt, 60-cycle, 3-phase motors operating at 1160 revolutions per minute, full-load rating. Motors are ceiling mounted on 9-foot open-belt centers to the lineshafts. Countershafts are on 8-foot centers from the lineshaft. By operating with longer centers belts do not need to be so light as to be hard on countershaft bearings.

No keyways are cut in the lineshafts which are connected with compression couplings. All lineshaft pulleys on the motor drives are split cast iron and split steel for drives to countershafts.

Motor belts are 5-inch heavy-double leather. Motors are mounted on stringers with ample provision for takeup so that they will not need to be cut and recemented after running in and in service. Two hangers are mounted on the lineshaft, one on each side of the driving pulley from motor. Motor belts are endless and are serviced by the leather belt manufacturer.

Countershaft belts are 3-inch light double leather which will stand up much better under shock loads when starting cuts, throwing in the clutch and in taking heavy cuts than would heavy single leather belts which, by computation, would be ample. However, by eliminating slippage and requiring less frequent takeups, this extra factor of safety has proved to be a profitable investment. Belts from countershaft to machine are 2-inch double leather. All leather belts are oak tanned. Countershafting and machine belts use metallic fasteners and are serviced by the plant millwright.

Lineshafts were erected and machines moved one at a time as they finished a run. While this extended the period of the changeover, it did not interrupt production. Everything was ready to connect up the machine as soon as it was placed in its new location. In this way a smaller force was required to handle the work. The manufacturer of the transmission equipment assisted in planning the layout and design of the superstructure. We are well satisfied with the installation during the few months it has been in operation.



Note antifriction bearings and duplex clutches on countershaft; also compressed coupling on lineshaft with hanger mounted between belts

Study Reveals Power Loss

■ WHENEVER a machine or drive is installed one of the first steps should be to check on the power consumption with the machine running idle and also in normal production. Abnormal power consumption may indicate improper connections within the motor, in certain types of motors—something wrong with the machine, such as a bent shaft, tight bearings, uneven mounting, improperly set gears or some other defect in the machine or installations. Or, again it may be improper feeding or adjustment, or perhaps an incorrect estimate of requirements.

Usually a study of the graphic power consumption record will indicate what may be responsible for the increased power consumption. To aid in locating any trouble, and also to provide a permanent record, engineers advocate using a graphic meter on such tests. Such pictured records permit detailed studies of consumption through complete cycles of operation and are much more helpful in present studies and for future reference than mere observation of the fluctuations of the needle of an indicating meter.

Some of the results of such studies are worth noting. For example, one company makes periodic graphic tests on a continuous coil-fed punch press, thus determining when the dies have worn to the point where they need regrinding, as indicated by the increased power consumption.

In another case, preliminary tests on a new machine indicated excessive power consumption. Investigation showed that the machine had been improperly assembled or damaged in shipment. As the crate had shown no evidence of rough handling the manufacturer was required to replace the bent shaft.

Improper feeding is often found to be responsible for excessive increases in load. A grinding mill drive motor showed a sudden tendency to overheat from overload. Investigation disclosed that the material ground was obtained from a new source and had a much larger proportion of coarse material than the former supply. Three remedies were obvious and they were to change the motor, install a preliminary crusher or to insist that the material supplied be the same as before.

Continuous graphic charts on equipment in continuous operation provide accurate check of charging or discharging time, idle periods, operation without full load or overloading, temperature control, or any irregularities in operation during the 24 hours. In such cases the usual procedure is to have the chart where the operators may see it as made and so check on themselves. This assists in better operation of the equipment.

Seldom is it advisable to withhold the records from the men, except when calling them to account, as this may be considered a form of spying. The greatest value of these records is to assure proper operation, and therefore the records are of greatest use to the operators in guiding them in their work.

Periodic charts should be taken of the entire power and light load at the main feeder buses, on each main distribution circuit and on individual drives and lighting circuits. These records provide accurate checks on unknown losses, such as grounds, overloads in sections of the plant or other conditions which may cause loss or trouble if permitted to continue. Users of power will find the graphic meter of invaluable assistance in locating and correcting power troubles and in controlling the operation of equipment.

♦

Belt dressings must be applied before slippage burns the belt. Burning ruins belts and no treatment will restore its life and usefulness.

♦

When considering a change in methods of driving machines do not overlook effect on maintenance, servicing, repairs and inventory of spare parts or drive units which must be carried in stock. Sometimes the extra work may necessitate increasing the force and shop facilities and thus adding expense.

Foundry Association Publishes Transactions

■ *Transactions of the American Foundrymen's Association, Vol.* 45, cloth, 850 pages, 6 x 9 inches, published by American Foundrymen's Association, 222 West Adams street, Chicago, and supplied by STEEL, Cleveland, for $10; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster S. W. 1, London.

This volume includes papers and committee reports presented at the 1937 convention of American Foundrymen's association in Milwaukee, Wis. Included in the contents are papers devoted to various phases and practices in the different branches of the foundry industry; namely, gray iron, malleable iron, steel and nonferrous castings.

Papers of interest to gray iron foundrymen are those on wear testing, cupola high-test cast iron, effect of coke size on cast iron, occurrence and control of ferrite in cast iron, a summarization of the information available on graphitization and inclusions in gray iron, effect of composition and section size on plain cast iron, microstructure and physical properties of alloy cast iron, and cost methods used in gray iron foundries.

Malleable division is represented by papers on heat treatment of malleable irons, selection of cycle and type of furnace for annealing, sand control in malleable foundries, melting developments and cost methods.

The steel division will find papers on contraction stresses, test coupons, heat treatment, sand control, methods of producing steel for castings.

Nonferrous foundrymen will be interested in papers on sand control, production of pressure-tight, 30 per cent cupro-nickel castings, a discussion of problems in the manufacture of bronze castings and nonferrous foundry cost methods.

In addition there are many papers of general interest such as those on refractories, radiography, etc., with a 10-page cross index in the rear of the book.

First English Text on Powder Metallurgy

■ *Principles of Power Metallurgy*, by W. D. Jones; cloth, 199 pages, 5⅜ x 8½ inches; published by Longmans, Green & Co., New York; supplied by STEEL, Cleveland, for $5; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author in preparing this first book in the English language on the subject of powder metallurgy has performed an excellent service. Information on the subject heretofore has been widely scattered and much of that is in Germany and Russian. The book deals only with the use of metal powders for forming solid articles by pressure and heat, and in it the author has attempted to reconcile and explain conflicting facts and opinions.

The book is divided into six chapters of which the first discusses the principles of sintering massive metals. Chap. II describes the principles of sintering comminuted metals, and points out the effect of particle size and shape, applied pressure, temperature, gases and vapors, sintering forces, etc. Physical properties of sintered metal compacts, and influence of method of preparation are dealt with in Chap. III where such phases as nature of sintered boundary, general characteristics, extra sintering phenomena, grain growth, etc., are discussed.

Chap. IV describes industrial applications of various powders, including platinum, iron, nickel, nickel-iron, bronzes, chromium, tungsten, etc. Chap. V is concerned with manufacturing hard metal alloys by sintering, including the application of hot or cold pressing. The sixth and final chapter describes the manufacture, properties and testing of metal powders.

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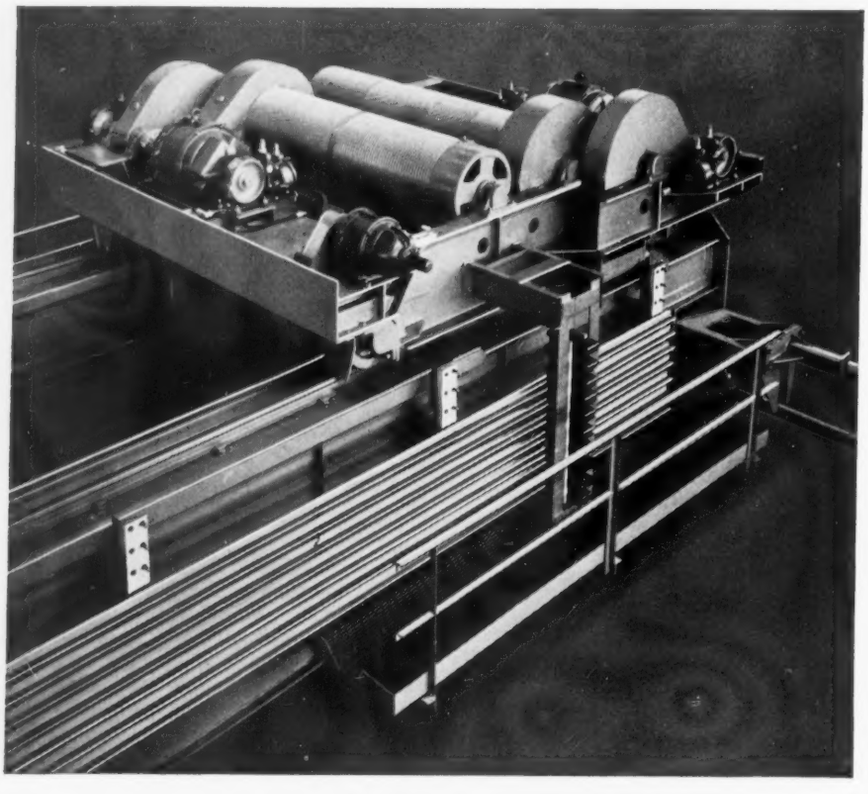

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MATERIALS HANDLING EQUIPMENT

Automatic Crane Scales Speed Warehouse Work

(*Concluded from Page* 50)

hand-propelled floor trucks. The recording device prints duplicate tickets showing gross, tare and net weights. One copy is retained in the company's office as a record, the other is attached to the shipment.

Use of the automatic printing feature on each of the scales is said not only to simplify record keeping for the company, but also to provide

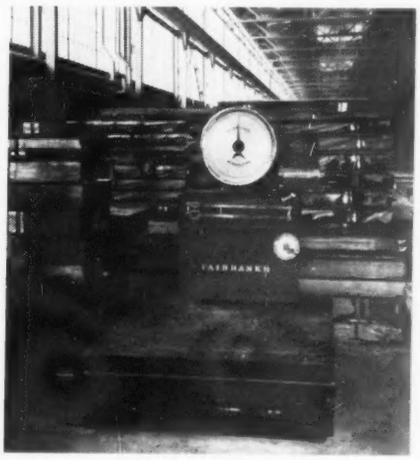

Fig. 3—This is one of five portable 5,000-pound capacity scales which are moved from point to point for quick service

a simple method of assuring customers that the weights as shown on the duplicate are those recorded in the warehouse.

Also there are five special portable dial scales of 5000-pound capacity normally stationed near saws, shears and bar stocks. One of the 10,000-pound built-in scales is shown in Fig. 2. On the platform is one of the floor trucks, in this instance transporting a load of strapped sheets. One of the portable units is shown in Fig. 3.

Besides a plentiful supply of cranes, scales, lifters and floor trucks, there also is an adequate arrangement of steel storage racks located at strategic points throughout the three bays. Neat storage of tiered piles of steel sheets is noticeable. Wide aisles are provided throughout the plant to facilitate trucking.

Truck Business Has Best Year Since 1929

■ Statistics released during the month of April by United States department of commerce in its "Survey of Current Business" substantiate frequently expressed opinions that the year 1937 was for most branches of the materials handling equipment industry the best, with the single exception of 1929, in the entire period for which records are available.

During the past year, the electric industrial truck industry reported total shipments of 1844 electric trucks and tractors. Only 1929, with a record shipment of 2080 machines, exceeded the 1937 demand for this class of handling equipment. Also, in that same twelve month period the electric overhead crane industry repeated orders for a total of 9864 units.

Magnetic Properties of Iron and Its Alloys

■ *Gmelins Handbuch der Anorganischen Chemie, Eisen, Teil D, Erg.—Bd* 1, (Gmelins Handbook of Inorganic Chemistry, Iron, Part D, Supplementary Section 1), edited by the German Chemical society; paper, 146 pages, 7 x 10 inches; published by Verlag Chemie, Berlin, Germany; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, London.

This volume, printed in German, is another in the series comprising Gmelin's inorganic chemistry handbook. It deals with the magnetic and electrical properties of iron and its alloys. It is divided into eight main sections. The first is concerned with magnetic properties of pure and carbon bearing iron, and the second with magnetic properties of the atom. The third part discusses magnetic properties of materials, and the fourth relates to electrical properties of materials.

Part V describes magnetic properties of alloy materials and the sixth is concerned with electrical properties of those materials. Part VII is given over to a brief resume, and a forecast on the sphere of magnetic properties of alloy materials. The final section is devoted to a recapitulation of the preceding matter, arranged in the form of tables.

Choose Steel Houses For Golden Gate Exhibit

■ Modern steel bungalows will attract attention to the "business appeal for Christianity," sponsored by the Christian Business Men's committee at the Golden Gate exposition in San Francisco in 1939.

Two or three of the new Le Tourneau portable steel dwellings will be set up as part of the $40,000 exhibit on Treasure Island. These were designed by R. G. Tourneau, vice president of the committee, for his factory personnel at Peoria, Ill. The standard welded structure is 32 x 44 feet, weighs 41 tons.

One of these houses will be fitted as a dwelling for exhibition purposes; another will be offices for committee members; a third may contain a bible exhibit. In a large steel auditorium, the committee will present Irwin A. Moon and his "Sermons from Science."

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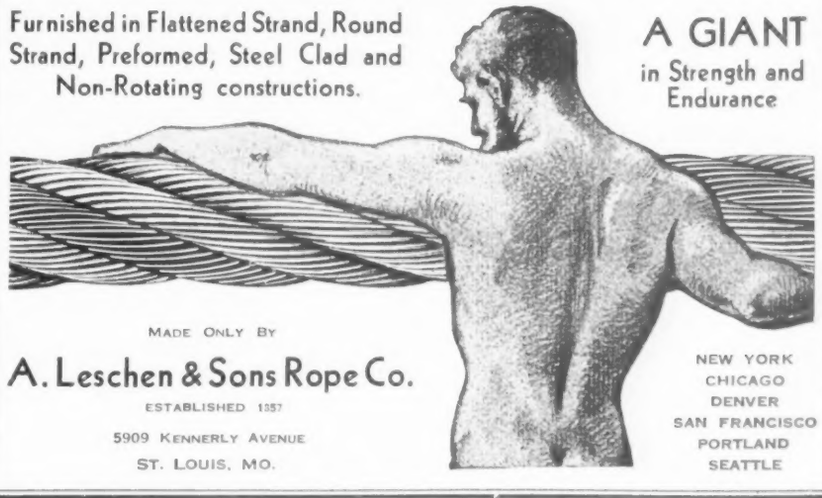

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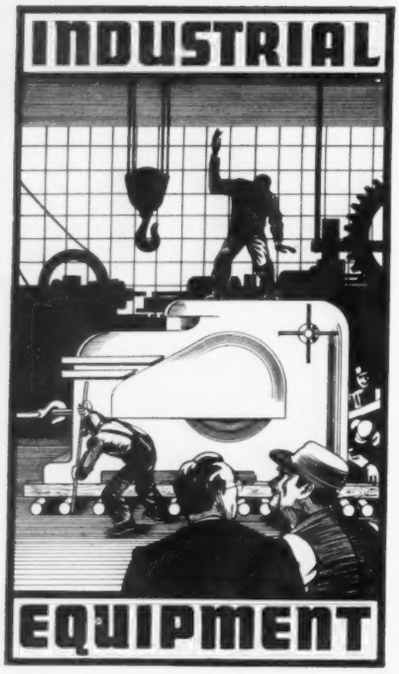


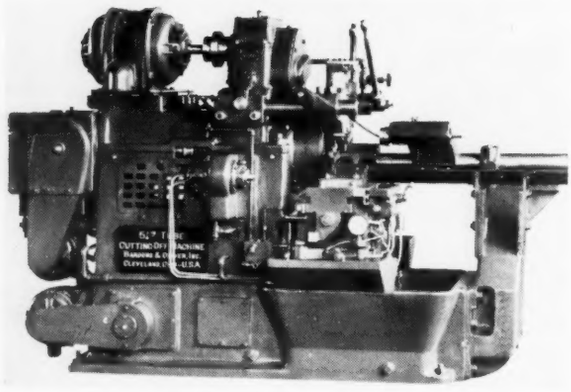
Extra Length Provided In Carriage Roll Grinder

■ Landis Tool Co., Waynesboro, Pa., has placed on the market a dual wheel, carriage type 30 roll grinder which is used to semifinish and finish grind conventional types of rolls.

Size of the machine is 36 x 168 inches. The rear bed section has extra length so that two standard wheel carriages may be mounted on it. Either carriage grind rolls the full capacity of the machine without interfering with the second carriage which is always out of the way. Wheel heads are claimed to track within a close degree of accuracy.

Machine is equipped with the new standard work drive which is incorporated in all type 30 rollers. It consists of the conventional work drive motor mounted on a base at the left end of the machine where it is directly connected to a speed reducing unit. The machine weighs approximately 185,000 pounds with all its electrical equipment. Among the equipment are included 15 electric motors having a total of 96½ horsepower. These include two traverse, drive motors, two water pump motors, two electric, wheel head cross movement motors, two wheel spindle, oil pump motors, two wheel drive motors, work drive motor, footstock traverse motor and a center grinder motor. The wheel drive motor used on the semifinishing carriage produces 850 to 1700 revolutions per minute, while the one used on the finishing carriage has an output of 600 to 1800 revolutions per minute.

All motors for complete operation, may be controlled from the wheel carriage being used. Wheel carriage motors are interlocked in such a manner that when one is operating the other cannot be operated. A jog switch at the front of the headstock enables the operator to examine the roll from the front of the machine. Limit switches prevent overtravel of either wheel carriage or either wheel base.



All movements of this Bardons & Oliver automatic cutoff machine are synchronized and controlled by an adjustable trip dog mounted on the front tool slide

Tubing Cut Rapidly On Automatic Unit

■ Bardons & Oliver Inc., 1133 West Ninth street, Cleveland, has placed on the market an automatic cutoff machine developed to cut light and heavy wall tubing, pipe and bar stock at a rapid rate of production. Maximum diameters of 5¼ inches can be handled.

Machine has two slides, one front and one rear, each carrying cutoff tools which operate simultaneously, permitting the chip to be divided equally and reducing the cutting time to a minimum. Where pieces are too long, multiple cuts can be taken and two or more pieces can be cut off at one time. Both slides, having rapid approach, feed and return are hydraulically operated. Two pumps are used for this purpose. The pump that feeds the slides is geared directly to the spindle, and feeds are obtained in thousandths of an inch per spindle revolution. The feed is adjusted by turning a graduated dial located directly on the pump. Constant rapid traverse is maintained by the second pump which is driven by a separate motor. Slides are of steel, hardened and ground, and operate on hardened and ground wearing strips in the saddles.

When the machine is running automatically, a hydraulic valve controls movement of the two slides by means of trip dogs. This valve may also be operated manually when setting up on short run jobs of a few pieces or when cutting off crop ends of pipe where the end is first cut off and then chamfered.

A wide range of spindle speeds is obtained by means of change gears. All gears and shafts are heat treated alloy steel. Spindle is mounted in tapered roller bearings and controlled by a lever located in front of the machine. Gears and anti-friction bearings run in a circulating bath of oil provided by a pump and a cascade system of lubrication.

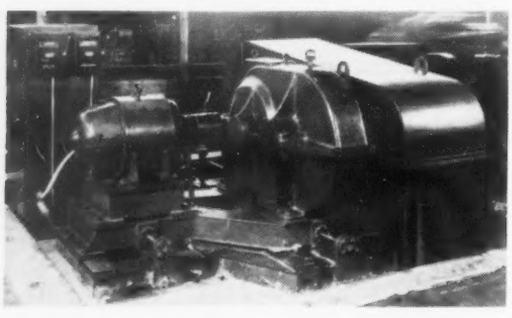


Illustration shows the left end of the Landis type 30 roll grinder work drive. The grinder weighs approximately 185,000 pounds and is equipped with 15 motors

Welder Transmission Has 3 to 1 Speed Ratio

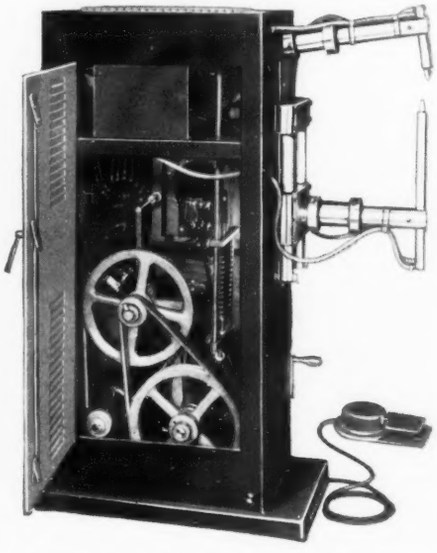
■ Pier Equipment Mfg. Co., 813 Cross street, Benton Harbor, Mich., has placed on the market a new series of motor driven automatic spot welders which provide control over welding variables essential to uniform production.

Some of the outstanding features include vari-speed transmission with a 3 to 1 ratio speed variation, mechanical weld timing control by which welding time can be set to as fast as 1½ cycles and precision of pressure applications and accuracy of timing.

Power drive of the unit consists of a vari-speed drive, double reduc-

tion V-belts, pin type clutch and magnetic clutch trip. Clutch is actuated through a magnetic unit controlled by a foot switch which is attached to a flexible rubber-covered cable. This cable can be placed in any convenient position, leaving the operator's hands free to handle the work.

Speed of operation is adjusted through a crank extending through the lower front of the welder. This adjusts the speed transmission. The



Speed operation of this Pier Equipment motor driven, automatic spot welder is adjusted through a crank extending through the lower front of the welder

standard units are made for speeds from 40 to 120 strokes per minute. Connecting rod of the welder has provisions for adjusting length of stroke to 1, 1½ and 2 inches. Pressure on work is produced through an adjustable pressure spring which is an integral part of the toggle lever action actuated by the power drive.

Horns of the welder are of solid copper and are machined on one end to hold electrodes at right angles, and on the other, to hold them at a 45 degree angle for welding in places difficult to reach. These holders are also water-cooled. The welders may be obtained in four sizes; 15, 20, 30 and 50 kilowatts.

Designed to Withstand Heavy Short Circuits

■ Delta-Star Electric Co., 2400 Fulton street, Chicago, has placed on the market a direct current unit designed to withstand heavy short circuits.

The unit has two sets of twelve 6 x ¼-inch bars with wide spacings between groups of six each carried on wet process insulators in compression. The clamps are provided with rollers and springs permitting bus expansion and contraction.

Steel frame is installed on the bottom flange of floor beams by means of ⅝-inch bolts and beam grips. Adjusting nuts between the frame and end insulators insure rigidity of supports without use of spacers.

Cold Steel Tubing Bent Without Wrinkles

■ American Pipe Bending Machine Co., 37 Pearl street, Boston, has placed on the market a cold steel tubing bender which does not require a mandrel or filling for bending without wrinkles or flattening.

Standard equipment of the unit bends 1-inch, outside diameter, 16-gage tubing to radii of 2½ to 12 inches. A steel plate spacing table with gages and pins aid in mass production work by quickly starting and stopping. The machine, which is known as type G-38, only requires two minutes for changing dies, gages and pins of different radii. Net weight of the unit is 600 pounds. It is well adapted to handle bending jobs required for metal chairs, fur-

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If Horsburgh & Scott Speed Reducers could be brought to your desk so that you could examine them, you would quickly recognize these outstanding advantages . . . 1. Ultra-simple in design. 2. Accurately cut gears with heavier, wider faces. 3. Anti-friction bearings. 4. Shafts and bearings oversize. 5. Heavy, ribbed, dust-tight housings. 6. Splash lubrication.

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niture, motor buses, air conditioning, airplanes and boats.

Motor Bases Float Against Spring Tension

■ Van-B Machine Corp., 955 Park avenue, Union City, N. J., has placed on the market automatic motor bases designed to float against correct spring tension, and will not permit a too rigid adjustment of a power drive.

Resilient action of the bases eliminate shock and stress against machine shafts and bearings, permitting smooth easy starting under shock load conditions. Design of bases permit accessibility without disturbing the motor hold down bolts. The bases are fabricated entirely out of steel.

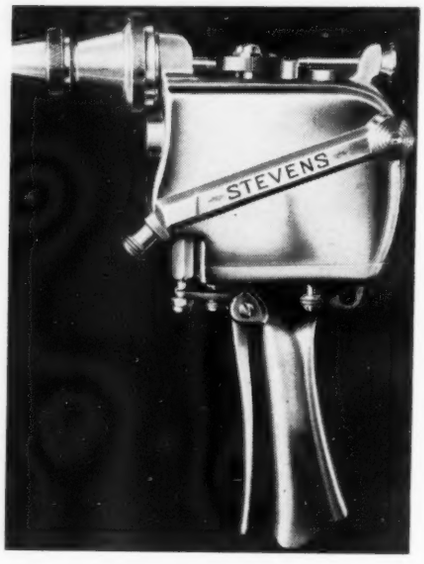
Smooths Fractures In Cast Metal Frames

■ Skilsaw Inc., 3345 Elston avenue, Chicago, has placed on the market a model N disc sander used for intermittent grinding of light welds, for sanding in repair work, smoothing fractures in cast metal frames and removing stencils and labels from barrels and shipping cases.

Body of the sander is streamlined. It is powered for fast grinding and sanding, and for use with wire wheel brushes in cleaning metal surfaces. Straightline ventilation assures a cool running motor while an effective air filter protects the commutator and motor from abrasive dust and dirt. Shafts are provided with ball bearings. The unit is 15¾ inches long and weighs 10½ pounds.

Spray Gun Applies Metal Coatings

■ Stevens Metal Spraying Inc., 83 Shipley street, San Francisco, has introduced a spray gun for the application of metal coatings. The gun is synchronized so that the feed is automatic.



Stevens metal spray gun has a 2-speed shift which makes possible the use of both soft and hard metals without complicated adjustments

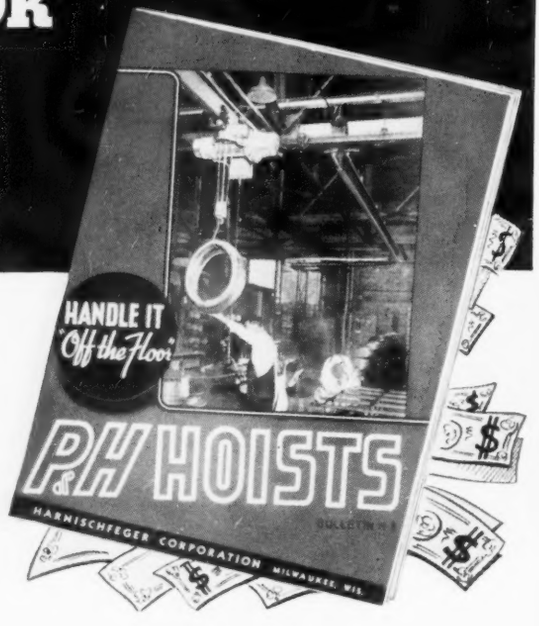
A feature of the gun is the 2-speed gear shift which makes possible the use of both hard and soft metals without complicated adjustments. The unit has a capacity of 8 pounds of aluminum per hour, 10 pounds of steel and 18 pounds of copper.

♦

Plastic Saw Handles

■ Molded plastic handles are now being incorporated on saws by Henry Disston & Sons Inc., Philadelphia. The plastic material is known as Tenite, and is said to possess such a tough characteristic that it will not chip, shrink or swell, and always maintains the proper hang on the saws. The plastic material is made of Eastman cellulose acetate.

THERE'S MONEY IN THIS BOOK FOR YOU



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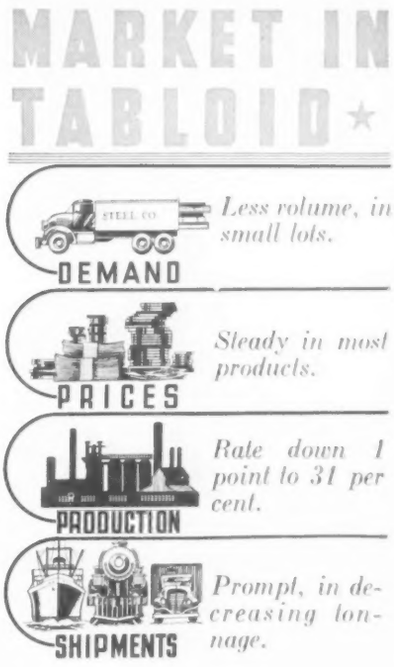
Downward Tendency in Buying Is More Marked

Ship, Car Awards Bring Tonnage for Future; Scrap Is Lower



■ SPRING seasonal factors having failed to support the market in expected degree a slightly downward movement is apparent in steel buying.

Consumers show no tendency to buy for the future, covering only current needs and wherever possible resorting to inventory. With April showing a smaller volume of specifications than March the first week in May has brought no indication of an upturn.

Factors in a mid-year revival are found in the new model season for automobiles, specifications for steel for an unusual volume of naval and private shipbuilding already placed and the hope that government aid may bring additional railroad purchasing. How much effect may be felt from the "pump priming" effort of the government is problematical and the time lag is likely to put this over for some time at best.

Aside from public work the structural field offers little tonnage, the total this year being somewhat more than half that bought in the same period last year. Agricultural implement activity is tapering, following the seasonal pattern, and this is felt in the volume of steel orders.

Eight of the 12 cargo ships on which the maritime commission opened bids last week have been awarded to eastern yards and placing of the remaining four is held in abeyance until the commission can investigate the ability of the low bidder to handle so large a contract. Four ships were awarded to the Federal Shipbuilding & Drydock Co., Kearney, N. J., and a like number to Sun Shipbuilding & Drydock Co., Chester, Pa. About 45,000 tons of steel will be required for these eight. Confirmation of award of four cargo carriers to a builder at Tampa, Fla., makes a total of 12 now placed.

Impending navy building holds out promise for fair tonnages during last half. Bids will be opened June 22 on four destroyers and three submarines, with an equal number to be built in navy yards. About 15,000 tons of plates and shapes will be required.

Southern railway has awarded 5550 freight cars, the largest order in more than a year. This assures this month having the largest total since April, 1937, when 9772 cars were bought. The orders were well distributed to builders in various sections and the steel for their construction will be bought from several mills. The Erie is in the market for a tonnage of rails and fastenings, with the probability of 10,000 tons being bought soon.

The national rate of steelworks operations receded 1 point last week, to 31 per cent. Continued dull conditions indicate this week may see a lower level of activity. Pittsburgh declined 1 point to 25 per cent, Chicago 1 point to 32.5, Wheeling 5 points to 41 and Cleveland 4 points to 28. Youngstown advanced 1 point to 30, Cincinnati 10 points to 40 and New England 3 points to 30. At five centers the rate held unchanged from the previous week, Eastern Pennsylvania at 27.5, Buffalo at 28, St. Louis at 36.3, Birmingham at 66 and Detroit at 18.

Pig iron production in April fell slightly under that of March, the daily average rate being 46,267 gross tons, which was 2.5 per cent lower than the 47,426-ton daily rate in March. This was the lowest for any month since December, 1934, and the lowest for April since 1933. Total production in April was 1,388,008 gross tons, compared with 1,470,211 tons in March, a loss of 5.6 per cent, partly due to the shorter month. This was the smallest monthly output since February, this year, and the lowest for any April since 1933. Output for four months aggregated 5,609,414 tons, compared with 13,110,853 tons for the same period of 1937, a decline of 57.2 per cent.

Automobile production regained some of its lost ground last week with 53,385 units, compared with 50,755 the preceding week, but still below the 60,563 units of the week of April 23. Last week General Motors made 23,285 cars, compared with 14,670 the week before, Chrysler 11,400, compared with 13,050, Ford 11,885, compared with 15,785 and all others 6815, compared with 7250.

Decline in scrap prices continues but at a slower rate, the composite last week dropping 12 cents, to $11.59. Scrap weakness also caused the iron and steel composite to move down 2 cents to $38.52. The finished steel composite continues steady at $61.70.

COMPOSITE MARKET AVERAGES

	May 7	April 30	April 23	One Month Ago April, 1938	Three Months Ago Feb., 1938	One Year Ago May, 1937	Five Years Ago May, 1933
Iron and Steel	$38.52	$38.54	$38.58	$38.61	$38.90	$40.06	$28.33
Finished Steel	61.70	61.70	61.70	61.70	61.70	61.70	45.10
Steelworks Scrap..	11.59	11.71	12.00	12.30	13.54	18.49	9.23

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 7, 1938	April 1938	Feb. 1938	May 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.77	2.765	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.25
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.25
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.15
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.80
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.90
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	5.35	5.35	5.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	37.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	May 7, 1938	April 1938	Feb. 1938	May 1937
Bessemer, del. Pittsburgh	$25.34	$25.30	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del. East. Pa.	25.34	25.34	25.34	25.26
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	25.21
No. 2 fdry., Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	26.215	26.215	26.215	26.135
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.77	107.49	107.29

Scrap

Heavy melting steel, Pittsburgh	$11.75	$12.70	$14.15	$19.55
Heavy melt. steel, No. 2, E. Pa.	10.25	11.55	13.25	16.85
Heavy melting steel, Chicago	11.25	11.45	12.15	17.55
Rails for rolling, Chicago	15.25	15.25	15.25	21.45
Railroad steel specialties, Chicago	13.75	13.75	14.85	21.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.25	$4.85
Connellsville, foundry, ovens	5.25	5.25	5.25	5.30
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Subject to Quantity Extras and deductions (Except Galv.)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.76c
Philadelphia, del.	2.72c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars, dock,	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.51c
Philadelphia, del.	3.47c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars, dock,	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.12c
New York, delivered	4.16c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars, dock,	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.20c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars, dock,	3.60c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.65c
Philadelphia, del.	3.77c
New York, del.	3.81c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pittsburgh	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.55c
Philadelphia, del.	2.44½c
Boston, delivered	2.68c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
St. Louis, delivered	2.54c
Pacific basing points, f.o.b. cars, dock,	2.80c
Do. floor plates	4.05c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.52c
Boston, delivered	2.66c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo, delivered	2.37½c
Gulf Ports	2.66c
Birmingham	2.40c
St. Louis, del.	2.54c
Pacific coast basing pts., f.o.b. cars dock,	2.80c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Philadelphia, del.	2.77c
Boston, delivered	2.89c
New York, del.	2.81c
Pacific coast basing pts., f.o.b. cars, dock,	3.00c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo, delivered	2.37½c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.67c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.77c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.70c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75
(Per pound)	
Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c
Pacific basing pts. f.o.b. cars, dock	3.05c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23½-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.72c
New York, del.	2.76c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Car axles forged, Pitts., Chgo., B'ham.	3.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to ⅞-inch	60-10 off
Do., 1 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	70-5 off

Square Head Set Screws

Upset, 1-in., smaller	80-5 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off

Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
11 and 12	59½	49

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch lap weld	59½
12-inch, lap weld	58½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.89	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.80-58.80
6 to 24-in., Chicago	54.80-55.80
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B Stnd. fittgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.83
Duluth	39.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleveland, No. 5 to ⅜-inch incl.	47.00
Do., over ⅜ to 41/64-in. incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.65

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16 25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Sulphate of ammonia	$23.50
Naphthalene flakes, balls, bbls. to jobbers	6.75c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., del. Pittsburgh 107.77

Spiegeleisen, 19-21% dom.
Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 106.50
2% carbon 111.50 1% 121.50
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.85-1.90

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrotitanium, c. l., prod. plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, f.o.b. Niagara Falls, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.80-3.10
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, f.o.b. Niagara Falls, ton $74.00
Do, spot 79.00
Less-ton lots, lb. 4.25c

Manganese Briquets, contract carloads, f.o.b. Niagara Falls, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled No. 10	Sheets: Hot Roll Ann. No. 24	Sheets: Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.00
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.75	5.00
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.19	4.19	3.89	3.89	5.49	3.94	4.69	5.34
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.09	4.29	4.29	3.99	3.99	5.59	4.04	4.79	5.44
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.40	4.65	4.65	4.30	4.30	5.90	4.10	4.85	5.50
Memphis	4.35	4.55	4.55	4.25	4.25	5.91	4.30	5.05	5.70
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	6.03	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.86	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.96	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.91	4.56	4.28	7.81	6.36	6.11	9.01	....	....
Baltimore	....	4.55	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.82	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.54	4.10	7.94	6.49	6.24	9.34	8.95	7.50
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.46	4.85	....	....	....	....	....	....	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, May 5

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.45 5 10 0	$18.49	2 6 0
Basic bessemer	....	17.89	2 4 6
Hematite, Phos. .03-.05	32.44 6 10 0*	.....	.....
Billets	$39.30 7 17 6	$43.22	5 7 6
Wire rods, No. 5 gage	56.26 11 5 6	41.01	5 2 6
Standard rails	$50.52 10 2 6	$46.23	5 15 0
Merchant bars	2.62c 11 15 0	1.90c	5 5 0
Structural shapes	2.37c 10 12 6	1.77c	4 17 6
Plates, ¼ in. or 5 mm.	2.58c 11 11 3	2.23c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.12c 14 0 0	2.82c	7 15 0*
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.45c	9 10 0
Bands and strips	2.95c 13 5 0	1.99c	5 10 0
Plain wire, base	4.35c 19 10 0	2.23c to 2.64c	6 2 6 to 7 5 0
Galvanized wire, base	5.18c 23 5 0	2.85c to 2.95c	7 17 6 to 8 2 6
Wire nails, base	4.13c 18 10 0	2.54c to 2.72c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.05 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$27.30 5 9 0(a)	$15.72	563.50	$19.38	575	$25.35	63
Basic bess. pig iron	24.95 5 0 0(a)	.....	....	.....	....	27.97	(b)69.50
Furnace coke	8.11 1 12 6	5.72	205	7.25	215	7.65	19
Billets	39.30 7 17 6	23.43	840	28.98	860	38.83	96.50
Standard rails	2.26c 10 2 6	1.50c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.72c 12 4 0††	1.40c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.46c 11 0 6††	1.37c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c 11 14 3††	1.76c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.51c 15 15 0§	2.03c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.13c 18 10 0	2.93c	2,250	4.43c	2,950	6.66c	370
Plain wire	4.35c 19 10 0	2.16c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.89c 12 19 0††	1.57c	1,210	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 64.3 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Bos. dock No. 1 exp.	11.00
N. Eng. del. No. 1	11.50
Buffalo, No. 1	11.00-11.50
Chicago, No. 1	11.00-11.50
Chicago, auto, no alloy	9.50-10.00
Chicago, No. 2 auto	8.50- 9.00
Cincinnati	8.00- 8.50
Cleveland, No. 1	10.50-11.00
Cleveland, No. 2	9.50-10.00
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1	12.00-12.50
Eastern Pa., No. 2	10.00-10.50
Federal, Ill.	9.50-10.00
Granite City, R. R.	10.25-10.75
Granite City, No. 2	9.25- 9.75
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.00-11.50
New York, No. 1	†10.00
N. Y. dock No. 1 exp.	11.00
Pitts., No. 1 (R. R.)	13.50-14.00
Pitts., No. 1 (dlr.)	11.50-12.00
Pittsburgh, No 2	10.50-11.00
St. Louis, R. R.	10.25-10.75
St. Louis, No. 2	9.25- 9.75
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dlrs. No. 1	9.00
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo	9.00- 9.50
Chicago, factory	10.00-10.50
Chicago, dealer	9.50-10.00
Cleveland	10.00-10.50
Detroit	7.50- 8.00
E. Pa., new mat.	12.00-12.50
E. Pa., old mat.	8.00- 8.50
Los Angeles	12.50-13.00
Pittsburgh	11.50-12.00
St. Louis	6.00- 6.50
Valleys	11.50-12.00

BUNDLED SHEETS

Buffalo, new	9.00- 9.50
Buffalo, old	8.00- 8.50
Cincinnati, del.	7.50- 8.00
Cleveland	7.50- 8.00
Los Angeles	11.00-11.50
Pittsburgh	10.50-11.00
St. Louis	5.25- 5.75
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	3.50- 4.00
Detroit	4.75- 5.25
†Los Angeles	3.75- 4.00
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	16.00-16.50
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	15.25-15.75
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	16.25-16.75
St. Louis, 2 ft. & less	14.00-14.50

STEEL RAILS, SCRAP

Boston district	†10.00
Buffalo	13.00-13.50
Chicago	11.00-11.50
Cleveland	14.00-14.50
Pittsburgh	15.00-15.50
St. Louis	11.00-11.50
Seattle	16.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†7.00
Buffalo	10.50-11.00
Chicago, net	7.50- 8.00
Cincinnati, dealers	5.00- 5.50
Detroit, net	7.50- 8.00
Eastern Pa.	10.50-11.00
New York, fdry.	†7.50
St. Louis	6.75- 7.25
Toronto, dealers, net	8.00

SPRINGS

Buffalo	14.50-15.00
Chicago, coil	15.00-15.50
Chicago, leaf	14.00-14.50
Eastern Pa.	16.00-16.50
Pittsburgh	16.25-16.75
St. Louis	12.75-13.25

ANGLE BARS—STEEL

Chicago	13.00-13.50
St. Louis	11.50-12.00

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, crops	15.00-15.50
Cleveland, crops	17.50-18.50
Eastern Pa., crops	16.00-16.50
Pittsburgh, crops	16.50-17.00

FROGS, SWITCHES

Chicago	11.00-11.50
St. Louis, cut	11.25-11.75

SHOVELING STEEL

Federal, Ill.	9.50-10.00
Granite City, Ill.	9.25- 9.75
Los Angeles	15.00-16.50
Toronto, dealers	7.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	8.50- 9.00
Cincinnati, No. 2	8.00- 8.50
Eastern Pa., No. 1	13.50-14.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	9.75-10.25
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	12.00-12.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	9.00- 9.50
Chicago, No. 1	10.00-10.50
Cincin., No. 1, deal.	6.25- 6.75
Cincinnati, No. 2	2.00- 2.50
Cleveland, No. 2	5.50- 6.00
Detroit, No. 1, new	6.25- 6.75
Valleys, new, No. 1	10.00-10.50
Toronto, dealers	6.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	5.00- 5.50
Chicago	4.50- 5.00
Cincinnati, dealers	2.50- 3.00
Cleveland	5.50- 6.00
Detroit	3.25- 3.75
Eastern Pa.	6.50
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	6.50- 7.00
St. Louis	3.00- 3.50
Toronto, dealers	6.00
Valleys	7.50- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	5.00- 5.50
Cincinnati, dealers	2.00- 2.50
Cleveland	5.50- 6.00
Eastern Pa.	6.00- 6.50
Detroit	3.75- 4.25
New York	†2.50- 3.00
Pittsburgh	6.00- 6.50
Toronto, dealers	6.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†6.00
Bos. dist. for mills	†6.00
Buffalo	5.00- 5.50
Chicago	4.50- 5.00
Cincinnati, dealers	2.00- 2.50
Cleveland	5.50- 6.00
Detroit	3.75- 4.25
E. Pa., chemical	10.00-11.00
New York	†3.00- 3.50
St. Louis	3.00- 3.50
Toronto, dealers	6.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	11.50-12.00
New York	†8.00
St. Louis	7.00- 7.50

FORGE FLASHINGS

Boston district	†4.50
Buffalo	9.00- 9.50
Cleveland	10.00-10.50
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	10.50-11.00

FORGE SCRAP

Boston district	†4.50
Chicago, heavy	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	12.50-13.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	10.50-11.00
Eastern Pa.	10.00-10.50
St. Louis	8.00- 8.50
Toronto	7.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	16.00-16.50
Eastern Pa.	21.50-22.50
St. Louis	17.00-17.50

SHAFTING

Boston district	†13.00-13.50
New York	†14.00-14.50
Eastern Pa.	18.00-18.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	14.50-15.00
Chicago, iron	13.00-13.50
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	12.00-12.50
Eastern Pa., iron	14.50-15.00
Eastern Pa., steel	16.00-16.50
Pittsburgh, iron	14.50-15.00
Pittsburgh, steel	16.25-16.75
St. Louis, iron	11.50-12.00
St. Louis, steel	12.75-13.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†10.00
N. Eng. del. No. 2	11.50
N. Eng. del. textile	14.00-14.50
Buffalo, cupola	13.00-13.50
Buffalo, mach.	13.50-14.00
Chicago, agri. net	10.00-10.50
Chicago, auto	11.00-11.50
Chicago, railr'd net	10.00-10.50
Chicago, mach. net	11.00-11.50
Cincin., mach. cup.	10.00-10.50
Cleveland, mach.	16.00-16.50
Eastern Pa., cupola	14.50-15.00
E. Pa., mixed yard	12.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, No. 1	11.25-11.75
St. L., No. 1, mach.	12.75-13.25
Toronto, No. 1, mach., net	11.50

HEAVY CAST

Boston dist. break.	†7.25- 7.75
New England, del.	10.50-11.00
Buffalo, break.	10.50-11.00
Cleveland, break.	13.00-14.00
Detroit, break.	10.00-10.50
Detroit, auto net	11.00-11.50
Eastern Pa.	13.00-13.50
Los Ang., auto, net	13.00-13.50
New York, break.	†9.00- 9.50
Pittsburgh, break.	11.75-12.25

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	12.50-13.00
Chicago, R. R.	12.50-13.00
Cincin., agri. del.	9.25- 9.75
Cleveland, rail	14.50-15.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R.	14.00-14.50
Los Angeles	17.50-18.00
Pittsburgh, rail	14.00-14.50
St. Louis, R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†11.00
Chicago	15.00-15.50
Eastern Pa.	16.00-16.50
New York	†14.50-15.00
St. Louis	13.25-13.75

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.50-13.00

LOW PHOS. PUNCHINGS

Buffalo	15.00-15.50
Chicago	13.50-14.00
Eastern Pa.	16.50-17.00
Pitts. (light & hvy.)	16.50-17.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	16.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

IMPORTANT Events Cast Their Shadows *BEFORE*

MAY 26

. . . The 47th general meeting of The American Iron & Steel Institute will be held in New York City. The largest, most important annual gathering of leaders in the steel and related industries.

★ ★ ★ MAY 27

. . . The BIG ISSUE of Daily Metal Trade with its special Institute Sections carrying the entire proceedings of this important meeting. (Your advertising opportunity.)

MAY 19

. . . Final advertising forms close. Reservation and copy requiring composition and proofs should be in Cleveland, May 11. WIRE your reservation today.

★ ★ ★ The Institute Issue of Daily Metal Trade (May 27) is the only publication carrying complete reports of proceedings, technical papers and discussions—with copy distribution to all subscribers and members of the Institute. For all companies furnishing equipment, materials or services to the steel producers and allied industries, this issue offers an outstanding advertising opportunity for presenting your sales message before the major executives, engineers and operators who read and retain this important issue.

NOTE: All Institute Sections will be printed on 60 lb. coated super-book stock, permitting use of 120 and 133-line screen halftones.

Daily Metal Trade

"The Newspaper of the Metal Industries"

PENTON BUILDING, CLEVELAND, O.

Sheets

Sheet Prices, Page 72

Pittsburgh—Production is holding at a steady level, between 30 and 35 per cent. Most orders have come from a variety of relatively small manufacturers with larger users still out of the market. Automotive releases have been irregular but are believed to be nearly finished as far as 1938 models are concerned. Galvanized sheet business is unchanged also, at an estimated 38 per cent. The decline in agricultural demand has been offset by a seasonal increase in manufacturing programs.

Cleveland—Specifications for both hot and cold-rolled sheets continue to come from miscellaneous sources for immediate delivery. In some exceptional instances forward buying is noted. Prices are unchanged.

Chicago—Sheet demand reflects a moderate decline in operations among some users. Absence of automotive buying is the major factor which is expected to prevail through most of the summer. Stocks of not only sheets but also manufactured products in hands of certain consumers also is restricting new business. Sheet deliveries range up to three weeks.

Boston—Sheet demand has not improved to any extent from the slight recession which developed two weeks ago. Industrial demand is notably light and most small tank builders are not active. Stamping shops and tackmakers are buying little, the latter being still well stocked. Jobber demand has leveled off to spotty fill-in needs.

New York — A mixed trend is noted in sheet buying with some sellers reporting slight improvement as compared with a week ago, and others reporting a decline. It would appear that volume as a whole is off somewhat. Miscellaneous building requirements are the main bulwark, although disappointing for this time of the year, and releases from makers of low priced stoves continue fair.

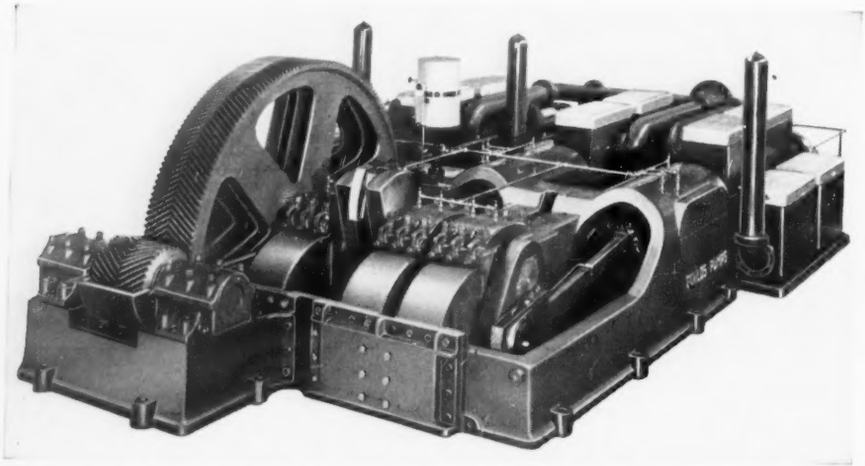
Philadelphia — A leading district automotive interest has released a little tonnage for the purpose of trying out dies for 1939 models. Another automotive interest has issued releases for about 500 tons of cold-rolled sheets against current requirements. New commitments for approximately 1000 tons still are pending. The largest radio maker is closed by strike and reports are current that operations will be moved to another city, possibly Detroit.

Cincinnati—Demand for sheets is fluctuating within narrow limits with fair tonnages going to warehouses and manufacturers of household and farm equipment. Automotive releases show no tendency to expand.

St. Louis—Purchasing of sheets, which had been tapering steadily for the past several weeks, has developed slight betterment since the third week of April. Stove manufacturers have bettered operations and are taking more raw materials. Enameling stock is more active, and galvanized material is showing greater activity than heretofore.

Milwaukee — Wisconsin state bureau of purchases, state capitol, Madison, is asking bids until May 24 for furnishing annual requirements of sheet steel for automobile license plates, manufactured at the state prison in Waupun. The quantity ranges from 200 to 250 tons. F. X. Ritger is director of the bureau.

Timberland Supply Co., Portland, Oreg., has succeeded the Pacific H. B. A. Steel Co. Inc. in the distribution and sale of steel and



FARREL-SYKES PRECISION GEARS CHOSEN FOR 48,000-BARREL CRUDE OIL PUMP

The constantly widening field for the application of Farrel-Sykes Precision Generated Continuous Tooth Herringbone Gears is well illustrated by their use in the huge Goulds pump shown here.

This pump has a capacity of 48,000 barrels of crude oil each 24 hours, pumped at 700 pounds pressure. The unit consists of a Goulds 6¾" x 36" horizontal, triplex, double-acting plunger pump, driven by a 750 H.P. Nordberg Diesel engine, with a pair of 6 to 1 ratio Farrel-Sykes Gears reducing the engine speed of 257 R.P.M. to a pump speed of 43 R.P.M.

The adaptability of Farrel-Sykes Precision Herringbone Gears to both large and small applications and to both high speed and low speed operations opens up an important field for savings in installation and maintenance costs.

The accuracy and strength of continuous tooth herringbone gears generated by the Sykes process gives lower tooth stresses and, hence, greater load carrying capacity than comparable spur gears. Thus, it is often possible to use smaller herringbone gears, with savings in weight and cost of gears and gear units, as well as in their subsequent cost of operation and maintenance.

For particulars of this and other applications, write:

FARREL SYKES GEARS

FARREL-BIRMINGHAM COMPANY, Inc.
322 VULCAN STREET - - - - - BUFFALO, N. Y.
The Gear with a Backbone

steel products in the Northwest. T. L. Hume is manager.

Strip

Strip Prices, Page 73

Pittsburgh—Strip production continues to lag. Both hot and cold-rolled divisions are estimated to be running at about 20 per cent of capacity. Cold strip operations over the past week have been slightly better than in hot mills.

Cleveland—Sellers of both wide and narrow strip report little change in current demand. Requirements from automotive sources are almost dormant, and specifications from household electrical equipment manufacturers and other similar consumers represent only actual needs. Mill operations are noticeably low due to absence of the normal demand from automotive interests and other large consumers. Prices are firm.

Chicago — Strip sales are below the peak rate of the year and the outlook for major consumers points to little possibility of any major recovery during this quarter. Automotive buying is lacking and while miscellaneous users are ordering at relatively frequent intervals, individual orders are small.

Boston—Demand for narrow cold strip is spotty, buying having leveled off to the recent low rate. The first few days of each month recently there has been a slight bulge in buying, the result of piecing out stocks, but this development failed to materialize in May. Consumer stocks are low in most instances, but demand for steel is curtailed by low operations of fabricators and sizable inventories of finished parts held by users.

New York — While consumer inventories of cold strip steel are light, substantial stocks of finished fabricated parts delay steel buying. Only fill-in needs are being bought with consumer operations low. Practically all orders are for prompt delivery. Operations are generally unchanged with some scattered decline of a few points by some eastern producers.

Philadelphia — Narrow strip buying apparently is holding to the April volume which was slightly better than for March. Sellers are particularly encouraged over the steady price situation.

Sheffler-Gross Co., Philadelphia, manufacturers' agent for heating equipment has been appointed representative in eastern Pennsylvania by the American District Steam Co., North Tonawanda, N. Y., maker of expansion joints, tile conduit, meters, and water heaters.

Cold-Finished

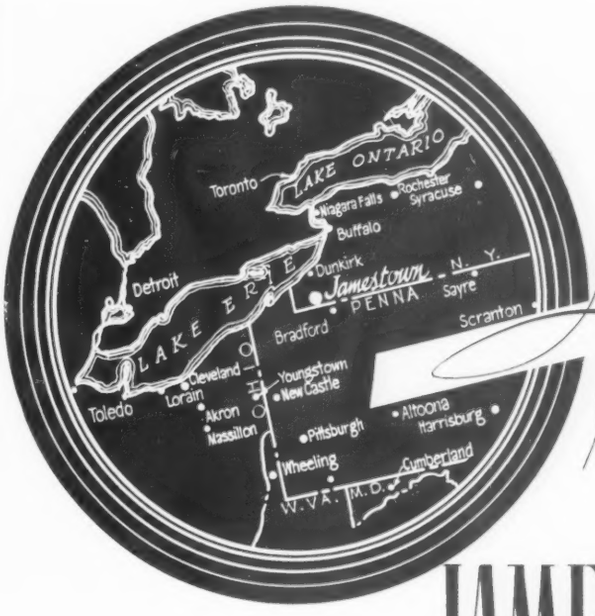
Cold Finished Prices, Page 73

Pittsburgh — Cold-finished steel bookings for April were only about one third of normal and represented a drop of about 10 per cent from March. Practically all sources of business are now quiet and the outlook is not promising. Agricultural implement builders, who formerly supplied a fair share of orders, have slowed down following the peak of their season. No substantial tonnages are on the books, the total representing an assortment of small orders.

Plates

Plate Prices, Page 72

Washington — Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and Sun Shipbuilding & Dry Dock Co., Chester, Pa., have been awarded



All roads lead to

JAMESTOWN

from Detroit to Wheeling to Cumberland to Scranton to Syracuse to Toledo when the call is passed for high quality malleable castings. Customers doing business within a three hundred mile radius of Jamestown are finding that the Jamestown Malleable Iron Corporation's modern facilities, quick delivery and consistent quality are bringing them more satisfaction and less gray hair. Continuous moulding, continuous pouring, continuous annealing, efficient and rapid cleaning, sand control, chemical and physical control, and complete pattern shop: these, the latest and best of modern facilities serve you in the shortest possible time. Look at Jamestown on the map; if you are within three hundred miles, you may take full advantage of our rapid service. May we look forward to hearing from you?

•

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Behind the Scenes with STEEL

Help Wanted

■ Even folks far removed from the iron, steel and metalworking industries know where to come when they want information about such fields. This week a young lady in Santa Barbara, Calif., writes: "I am making a project on steel for my chemistry class. Have you any information that I could use? Samples would be especially helpful, also any kind of literature."

We're not sure about samples (such as a bridge, a stainless steel train or an automobile or two) but be assured our young inquirer will receive the desired information and literature in the form of several copies of STEEL as well as divers pamphlets and propaganda on the metalworking industries. We might even sneak over into Joe Froggett's office and snitch some of his hunks of iron ore for her.

Fine Stuff

■ A recent query to our Readers Service Department brings up the subject of smallest gage steel wire and wants to know if there has been any development that would correspond with spun glass. We don't know what diameter spun glass is, but in glancing over some highly-interesting articles soon to appear in STEEL, we were absorbed by one describing the production of stainless steel wire 0.0019-inch in diameter. This, we think, is a fine development. In fact, it's so fine it takes three miles of the wire to weigh one pound. What's more—but wait till you read the story in one of our earlier issues.

Bigwords

■ With horrified interest this week we read of a new process for developing photographs, the intriguing thing being that the method involves painting the photographic paper with a simple solution known as Paradiphenylaminodiazoniumchloride. Notabadwordatall, although it's really sodamlongitsridiculous. Notashardtopronounceasitlooks, either, except that we never know quite what to do when we get to the "umch" part.

Add New Uses

■ One of our editors in the field reports the case of a fabricating concern that bought so much steel last year that they piled it all over the floors, set benches and machines on top of it and went right on working with a new steel floor under them. Our hope is that they'll come down to earth, and we do mean soon.

Subscribe STEEL

■ Hsiao Kwan Ying, dean of the college of engineering, National Sun Yat Sen university, Canton, China, begins a recent letter to us: "I have the pleasure to inform you that we have asking the General Library of this University to subscribe all magazines we need since last year". Which just reminds us to remind you that in this country alone there are 421 libraries, schools and associations who also find STEEL is necessary to their well-being.

New Table

■ For some weeks, STEEL's editors have had under consideration a new setup for the ferroalloys price table. Under the new plan, three times as much space would be required. However, with the growing importance of ferroalloys to the industry, the change has been made and the new table, larger and thoroughly comprehensive, appears this week on page 74.

This is just one of numerous changes that constantly are being planned or instituted in order that STEEL not only may keep abreast of the times, but anticipate changes an dnew trends in the industry. Thus the good old saying: "STEEL Is Modern"!

—SHRDLU

four steel cargo vessels by the maritime commission, requiring about 45,000 tons of steel. The four to be built by Federal will be steam-driven and those by the Sun company diesel-driven.

Award of the four remaining vessels for which bids were opened has been delayed until the commission can investigate the facilities of the Pensacola Shipbuilding Co., Pensacola, Fla., which is just being organized and was low bidder. The commission seeks to determine its qualifications for a construction contract.

Philadelphia—One district platemaker is operating at 50 per cent of capacity following substantial releases from the navy department. Other than the navy tonnage, ship plate orders have been of little consequence although one district builder is expected to release additional steel tonnage shortly. The tank trade is placing a few more small lot orders, which are taken as an indication of dwindling inventories. Some export business is noted but prices are well below domestic levels and this business is none too attractive.

New York—Local plate sellers are centering interest in two proposals, requirements of the 1250 hopper cars which the American Car & Foundry Co., with local purchasing officers here, will build for the Southern railway, and the 30 arc-welded steel sanitary scows on which bids are to be opened May 9 by the city department of purchases. These will require about 9000 tons of steel, principally plates. Miscellaneous demand continues spotty, with few tanks being figured and jobbers specifying slowly. Increasingly noticeable is the decline in oil company buying, which during the first quarter of the year was rather outstanding.

Boston—Except for enhanced outlook for private ship and navy yards outlook for plate demand is drab. Buying is light and has slipped off, industrial and fabricating requirements being smaller. Navy departments closes June 22 on four destroyers, three submarines and one tug and will allot to navy yards four destroyers and three submarines. Portsmouth, N. H., is likely to get part of the submarine tonnage. The eight destroyers take 6400 tons of plates and 2800 tons of shapes. Submarines require 3650 tons of plates and 1500 tons of shapes. The Harrisburg, Pa., mill is getting releases on plates recently bought for the Boston navy yard.

Cleveland—Plate requirements from miscellaneous private sources are substantially unchanged from April volume. Public work offers more encouragement, with substantial tonnage involved in the Main

street bridge project, Cleveland, and three standpipes for the city of Akron, O. Mill operations are irregular and little improvement is expected soon.

Chicago—Plate sales are made up principally of small lots. Structural fabricators are ordering light tonnages for minor jobs and few large tank orders have appeared lately. Prospects for heavier plate demand for railroad use are uncertain. Only small lots currently are moving for freight car building and repairs.

San Francisco—The largest plate inquiry since the middle of February has just come into the market and bids will be opened May 11 on 800 tons for a 25 and 36-inch welded steel pipe line for the East Bay municipal utility district, Oakland, Calif. So far this year 12,578 tons have been placed as compared with 24,234 tons for the corresponding period in 1937.

Plate Contracts Placed

250 tons, steel culverts for forest service, Missoula, Mont., to unstated interests.

210 tons, four welded steel tanks, Mathiesen Alkali Works, Virginia, to Chicago Bridge & Iron Co., Chicago.

150 tons, 18-inch steel dredge pipe, United States engineer, Memphis, Tenn., to New York Central Iron Works Inc., Hagerstown, Md.

140 tons, two 20,000-barrel tanks, Superior Oil Co., Cameron, La., to Wyatt Metal & Boiler Works, Dallas, Tex.

100 tons, steel storage tanks for Monroe and Lowell, Wash., to unstated interests.

Plate Contracts Pending

1000 tons, three standpipes, city of Akron, O.; bids are due May 10 on the first tank with 2,000,000 gallons capacity, bids for the second with 1,500,000 gallon capacity May 17 and no date set for third tank.

800 tons, 25 and 36-inch welded steel pipe, East Bay municipal utility district, Oakland, Calif.; bids May 11.

Unstated tonnage, 1,000,000-gallon elevated steel water tank, town of Lake, Milwaukee county; bids May 17.

Unstated tonnage, four storage tanks, 1,500,000-gallon capacity each, for Shell Petroleum Corp. at Toledo, O.

Bars

Bar Prices, Page 72

Pittsburgh — Inquiries for steel bars continue the downward trend and are appreciably lower this week. The early days of May have also seen a discouraging drop in tonnage and producers estimate May business will be less than April. Automotive releases are small and orders from other sources are not enough to offset decreasing automotive tonnage. Little relief is looked for before the end of summer.

Cleveland—Continued absence of demand from local auto partsmakers is reflected in present low mill operations here. Specifications are in approximately the same volume as in April, but are still limited to actual needs and for prompt delivery. Farm equipment concerns are comparatively active, but a slight easing in demand is noted. Prices are firm.

Chicago—Bar sales are off and shipments lately have suffered from the decrease in bookings the past 30 days. Business from farm equipment manufacturers reflects seasonal contraction in operations although consumption still is relatively better than among other principal users. Additional buyers have neared the bottom of stocks and the inventory problem no longer is regarded as an important factor in the resrticted rate of new business.

Boston—Soft steel bar buying is slow and spotty. While alloy orders are fairly frequent, tonnage is generally light, the same applying

STRIPS
THAT MAKE THINGS MOVE
The celluloid movie strip makes your favorite stars move, cars whiz by, aeroplanes in formation do amazing feats on the silver screen. Thomastrip also makes things move! Smooth and uninterrupted production lines are the result of Thomastrip accurately rolled to specifications. Bright cold rolled or electro finishes are available. And, through their use a "new high" for speed is sometimes the result. Send for samples of Thomas cold rolled strip or have a Thomas representative call . . . investigate the possibility of making things move faster with Thomastrip.
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COLD ROLLED STRIP STEEL
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THE THOMAS STEEL COMPANY • Warren, Ohio
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

to tool steel moving mostly through secondary sellers or from district mill representative stocks. Forging shop demand is spotty, but on the whole compares slightly more favorably with other bar material.

New York—Bar tonnage is fairly sustained, due to diversification of outlets. For the first time recently local sellers are having an opportunity of figuring on a fair quantity for cars recently placed by the Southern railway. However, there is little otherwise in the railroad field.

Philadelphia—Railroad shops are doing little repair work and bar requirements consequently are practically non-existent. Miscellaneous buying from other sources continues to show a slight tapering from March. Warehouses continue to provide a large part of the tonnage, reflecting the small-lot character of current buying. In the manufacturing trade, farm equipment makers are providing the brightest spot. Prices are firm.

Semifinished

Semifinished Prices, Page 73

Pittsburgh—Orders for semifinished steel have declined to a point where there is no outstanding activity in any division. Absence of buying from nonintegrated mills has been an important factor in the decline of the production rate in the district. Operations at smaller plants have gradually been curtailed to a point where semifinished demand is negligible and present stocks, although low, will suffice for some time unless there is a change not now foreseen.

Pipe

Pipe Prices, Page 73

Pittsburgh — Production rate on pipe and tubular goods remains near 40 per cent of capacity, unchanged for past several weeks. Inquiries are slow and although some substantial projects are being considered, there is little indication as to when any action may be expected on them. Most contemplated activity is in construction field, no pipeline projects being planned as yet. Jobber orders are largely for fill-in items and do not represent additions to stocks.

Cleveland—Cast iron pipe foundries note little change in general demand. Operations are on about the same level as in April. It is reported that Sandusky, O., will take bids soon for 3000 feet of 42-inch steel pipe and 17,000 feet of 24 and 20-inch cast iron pipe, for a new intake. Jobbers of standard steel pipe report stock turnover during April failed to improve.

Chicago — Cast pipe business, while near best volume for year to date, has had only moderate seasonal pickup. Most orders are small, only large inquiry pending being 3768 tons for Chicago.

New York—Resale merchant pipe market continues unsettled, with slightly mounting demands in building field creating even more severe competition among jobbers than recently. Resellers with consignment stocks are unable to participate to any extent due to mills' continued firm attitude. Pipe line tonnage is negligible.

Cast pipe inquiry has slumped with buying confined to small fill-in lots. Hackensack Water Co., New Jersey, placed 320 tons with the Phillipsburg, N. J., foundry. New York is expected to take bids this month on several thousand tons for yard stocks. Miscellaneous needs for highway work are slightly heavier. Utilities are buying little, mostly fittings.

San Francisco—Only two new inquiries of size developed last week. Treasury department, San Francisco, has taken bids on 188 tons of 8-inch, Class 250 pipe and bids will be opened May 11 for a pipe line from Palo Alto to Moffett Field, Calif., requiring approximately 6 miles, 800 tons, of 10-inch cast iron or steel pipe. Awards were limited to lots of less than 50 tons. To date this year 10,282 tons have been placed as compared with 14,742 tons for the corresponding period in 1937.

Seattle — Inquiry for tonnages is lagging, municipalities awaiting further federal grants. Lewiston, Mont., opened bids May 2 for several thousand feet of 12 to 20-inch cast iron pipe, over 1000 tons. King county, Washington, district 7 opened bids May 7 for a small tonnage of steel pipe and an unstated interest has taken 27,000 feet of 2 to 6-inch steel pipe for King county, district 5.

Cast Pipe Placed

275 tons, 12-inch, Newton, Mass., to R. D. Wood & Co., Florence, N. J.

100 tons, 8-inch, Holyoke, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Placed

Unstated, 2 to 6-inch King county, Wash., district 5, to unstated interest.

Unstated tonnage, 50 lengths, welded

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"The Hydraulic-Actuated Brake"
Low maintenance of cranes is assured if Wagner industrial brakes are made standard equipment for all steel mill bridge drives. Wagner industrial brakes are constructed to provide unusual accessibility to all parts — motor armature or brake wheel may be easily removed without disturbing any brake adjustments by simply removing only one pin. Ruggedness characterizes every detail of their construction — with welded steel parts, hardened pins and bushings, and cannonite brake wheels.
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steel shore discharge pipe, U. S. engineer, Charleston, S. C., circular 54; bids April 28, to Dixie Culvert & Metal Co., Jacksonville, Fla.

Cast Pipe Pending

1510 tons, 8000 feet of 24-inch and 8000 feet of 20-inch, new intake, Sandusky, O.

1000 tons or more, 12 to 20-inch, Lewistown, Mont.; bids in.

800 tons, 10-inch cast iron or steel, pipe line between Palo Alto and Moffet Field, Calif.; bids May 11.

250 tons, 24-inch, Chicago; Glamorgan Pipe & Foundry Co., Lynchburg, Va., low.

188 tons, 8-inch, class 250, treasury department, invitation 5328, San Francisco; bids opened.

Steel Pipe Pending

500 tons, 3000 feet of 42-inch, new intake, Sandusky, O.

143 tons, pontoon and shore pipe, U. S. engineer, Memphis, Tenn.; bids in, delivery Bridge Junction, Ark.

Wire

Wire Prices, Page 73

Pittsburgh—Demand for wire and wire products has reached lower levels occasioned by falling off in agricultural demand, and both merchant and manufacturers' wire divisions are quiet. Orders now reflect directly the existing demand inasmuch as inventories of manufacturers and jobbers have reached bottom in most instances. There has been a little more automotive buying, but the word is that this represents the end of specifications for the 1938 models.

Cleveland—Demand for merchant wire products is comparatively strong, but gradual slackening in requirements from agricultural centers is thought probable. No change has been noted in requirements for wire rods or manufacturers' wire.

Chicago—Wire business is quieter than a month ago and moderately below the March rate, when the spring peak in buying was reached. Some letdown has occurred in needs of manufacturers' wire consumers. Distributors of merchant wire products have accumulated fair stocks, with sales to users in farm areas relatively active. Wire prices are steady but some reports are heard of concessions on wire products.

Boston—With buying still limited to small lots, wire demand is barely maintained and some producers note a slight drop. Inquiry is well spread as to products, but car lot orders are few. Prompt delivery is specified on all tonnage. Mill schedules continue with aggregate finishing operations at 30 to 35 per cent of capacity.

New York — Odd-lot buying for immediate delivery makes up most wire volume, demand having flattened out with most shipments in less than car lots. Demand for merchant products has held longer and better than expected, although the peak has been passed.

Rails, Cars

Track Material Prices, Page 73

By virtue of the award of 5550 freight cars by the Southern railway, the largest in more than a year, this month is assured of having the best total since April, 1937, when 9732 cars were placed. The Southern order exceeds by approximately 4700 all the domestic freight cars placed previously this year. However, it leaves little inquiry active at present.

Only small inquiries for rails are active, principal items being 10,000 tons for the Erie and 5750 tons for the Wabash. Progress is being made at Washington in the formulation of legislation intended to provide financial assistance to railroads for equipment building and maintenance work. Grand Trunk Western has bought two diesel switching locomotives.

Columbia Steel Co. and Bethlehem Steel Co. submitted identical figures for 240 gross tons of 70-pound tee rail for the municipal railway at San Francisco and this interest will take bids on May 16 for 275 gross tons of 110-pound girder rails.

Car Orders Placed

Southern Railway, 5550 freight cars, as follows: 2000 box cars to Pullman-Standard Car Mfg. Co., Chicago; 1000 box cars, 2000 furniture cars and 50 mill type gondola cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, N. Y.; 1250 steel gondolas to American Car & Foundry Co., New York; 700 steel gondolas to Pressed Steel Car Co., Pittsburgh; 250 stock cars to Ralston Steel Car Co., Columbus, O.; and 100 steel flat cars to Greenville Car Co., Greenville, Pa.

Locomotives Placed

Grand Trunk Western, two 600-horsepower diesel switching locomotives to Electro-Motive Corp., LaGrange, Ill.

Car Orders Pending

Seaboard Air Line, six lightweight passenger coaches and four baggage and mail cars; bids asked.

Locomotives Pending

Akron, Canton & Youngstown, three or

ONE FENDER Speed Nut LIFTS 3000 LB. SEDAN

The incredible strength of Tinnerman SPEED NUTS is graphically shown in this lifting test. An automobile weighing 3025 lbs. was completely lifted off the floor with a single fender SPEED NUT of spring steel weighing less than ¼ ounce. But unusual strength is only part of the story. Important to you is the fact that the SPEED NUT system of assembly is both better and faster and costs less.

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That means a wider profit margin to work on and yet improving the finished product rather than cheapening it. Over 500,000,000 already used. Over 250 different shapes and sizes already adopted. Let our development engineering department show you how the SPEED NUT system of assembly can help you now.

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Manufacturers of Patented SPEED NUTS

four 2-8-2 type locomotives, contemplated.

Rail Orders Pending

Erie, rails and fastenings, about 10,000 tons; bids asked.

City of San Francisco, 240 tons 70-pound rails Columbia Steel Co. and Bethlehem Steel Co. identical bids; bids opened; 275 tons 110-pound girder rail, bids May 16.

Shapes

Structural Shape Prices, Page 72

New York—Pending projects approximate 15,000 tons, mostly public works, bridges and tunnels. Contracts for 1000 tons of New York state bridges are pending. An increasing volume of steel for world's fair buildings is coming out. For structures being erected by the fair organization, the bulk of fabrication is being done at Elmira, N. Y. A 4000-ton printing office building, Washington, closes May 20.

Pittsburgh — New projects continue to come out in fair numbers but tonnages involved are generally small. Producers are hoping for an increased number of public projects as the summer comes on and see good possibilities for a fair season.

Cleveland — Structural projects from private sources continue slow. Awards have also shown little improvement so far this month. Public work is in comparatively encouraging volume, with interest centered on the new cloverleaf development, Brecksville, O., involving approximately 1400 tons. Fabricated prices continue unsteady.

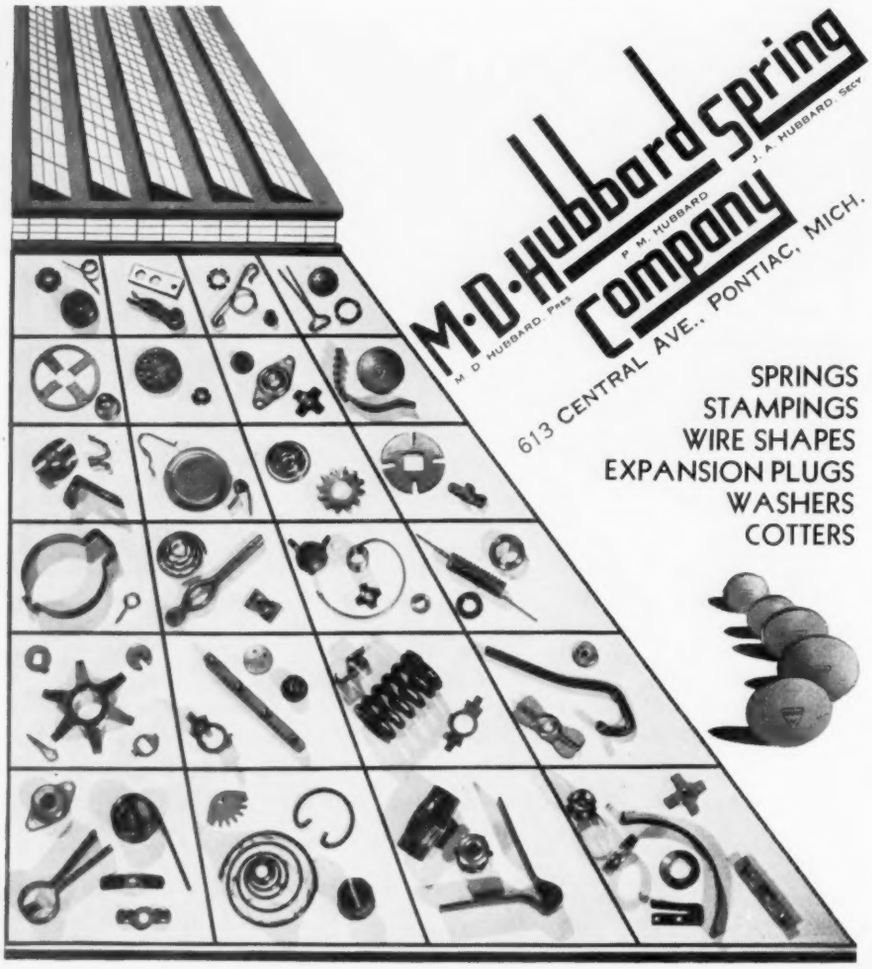
Chicago — While structural inquiries are fairly numerous, the fact most new work involves only small lots is restricting total business. New inquiries of more than 12,000 tons are made up of nearly 200 individual items.

Boston—Award of 2200 tons for a hospital building, Boston, to the Everett, Mass. fabricator is the largest item here. About half of the 700 tons for Vermont bridges have been bid, the remainder closing May 13. The 617-ton bridge, North Kingston, R. I. is still unplaced. Maine has additional bridge inquiries out, but they are small. A state office building, Concord, N. H., 400 tons, is among new inquiries.

Philadelphia — Fabricators expect the White Hill industrial school job at Harrisburg, Pa., involving 3300 tons and the Mt. Gretna prison project taking 550 tons will be readvertised for bids within the next few weeks. Financing details have not been worked out as yet for the all-weather highway from Harrisburg to Pittsburgh, but it is expected that this will require between 9000 and 10,000 tons of shapes. The Pennsylvania state highway department is taking bids May 13 on several small bridge jobs aggregating about 300 tons. Few new jobs are coming out and prices are weak.

San Francisco — Pending tonnage is light and does not exceed 1600 tons. The largest award went to Bethlehem Steel Co. for transmission towers for the Boulder dam project in Nevada. J. H. Pomeroy & Co., San Francisco, was low on 625 tons for the United States engineer office, San Francisco. Approximately 3000 tons of shapes and plates will be required for the Pensacola dam and power house for the Grand river dam authority, Vinita, Okla., bids June 3.

Seattle — Unstated tonnages are involved in three large contracts awarded by the interior department on bids opened several weeks ago at Denver. Consolidated Steel Corp. Ltd., Los Angeles, has the award at $1,089,937, for furnishing 43 ring seal gates for outlets at Coulee dam and also for power penstocks at Seminoe dam, Wyoming. Joshua Hendry Iron Works, San Francisco, will furnish 40 ring seal gates for Coulee dam. Reclamation bureau, Denver, has called bids, May 20, special 781, for stop log guides and appurtenances for the 18 main penstocks, Coulee dam. Busines pending includes 250 tons for a school at Moscow, Idaho, Colonial Construction Co., Spokane, general contractor.



Shape Contracts Placed

2300 tons, hospital building, Massachusetts General hospital, Boston, to New England Structural Co., Everett, Mass.

1500 tons, superstructure, U. S. Government building, World's fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through George F. Driscoll Co., Brooklyn, general contractor.

Shape Awards Compared

	Tons
Week ended May 7	5,615
Week ended April 30	22,349
Week ended April 23	25,971
This week, 1937	25,213
Weekly average, year, 1937	16,060
Weekly average, 1938	16,079
Weekly average, April	24,340
Total to date, 1937	519,832
Total to date, 1938	305,504

Includes awards of 100 tons or more.

410 tons, gate towers, Chickamauga dam, Tennessee valley authority, Knoxville, Tenn., to Erie Steel Construction Co., Erie, Pa.

250 tons, bridge FAS-FAP-804-B, Coleman county, Texas, to Austin Bros., Dallas, Tex.

185 tons, bridge 1406, Hinton county, West Virginia, to American Bridge Co., Pittsburgh.

175 tons, protection angles, Owensboro, Ky., to Kilby Car & Foundry Co., Anniston, Ala., through U. S. engineer, Louisville, Ky.

165 tons, transmission towers, specification 1051-D, Boulder dam, Nevada, to Bethlehem Steel Co., San Francisco.

150 tons, school, Greigsville, N. Y., to Buffalo Structural Steel Co., Buffalo.

140 tons, bridge, section 11-F-1, West Frankfort, Ill., to Michelmann Steel Construction Co., Quincy, Ill.

115 tons, bridge 391, Trempealeau county, Wisconsin, to Lakeside Bridge & Steel Co., Milwaukee.

115 tons, bridge FAP-13-A, Runnels county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

110 tons, bridge FAP-711, Reeves and Loving counties, Texas, to Austin Bros., Dallas, Tex.

Unstated, 43 ring seal gates for Coulee and Seminoe dams, to Consolidated Steel Corp., Los Angeles.

Unstated, 40 ring seal gates for Coulee dam outlets, to Joshua Hendry Iron Works, San Francisco.

Unstated, conduit lining sets for outlet works, Coulee dam, to U. S. Foundry Co., Burlington, N. J.

Shape Contracts Pending

4000 tons, annex building No. 3, U. S. printing office, Washington; bids May 20.

3000 tons, plates and shapes for radial gates and penstocks, etc., Grand river dam authority, Vinita, Okla.; bids June 3 for Pensacola dam and power house.

660 tons, state cancer clinic, Buffalo; rebid May 19.

625 tons, invitation ER 868-38-134, United States engineer office, San Francisco; J. H. Pomeroy & Co., San Francisco, low.

600 tons, gun casemates, Fort Cronkhite and Fort Funston, army engineers' office, San Francisco.

500 tons, state office building, Concord, N. H.

394 tons, miscellaneous unfabricated shapes, including reinforcing bars, city of Chicago; bids to commissioner of public works May 12.

375 tons, Wards Island sewage treatment plant, New York, contract 22; bids May 17; also 135 tons of plates and 130 tons steel sheet piling.

370 tons, subway, project FAGM-1, Lincoln, Nebr.

350 tons, store building, S. H. Kress Co., Alexandria, La.

300 tons, bridges, Pennsylvania state highway department, Harrisburg; bids May 13.

285 tons, Burt bridge, 38-6, Niagara county, New York; Earl L. Harrington, Buffalo, general contract, $86,822.10; bids April 26, Albany.

230 tons, state highway bridge RC-3941, Gardiner, N. Y.

225 tons, bridge, West 238th street, New York; Kennedy & Finnerty Co., New York, low.

200 tons, plant addition, Hohenadel Brewing Co., Philadelphia; bids in.

200 tons, building, Corn Products Refining Co., Pekin, Ill.

190 tons, apartment building, Sceneridge apartments, Brentwood, Pa.

187 tons, bridge, Springer, N. Mex.

185 tons, tube gates for Chickamauga dam, Chattanooga, Tenn.

180 tons, steam power plant, Northwestern Paper Co., Green Bay, Wis.

150 tons, highway bridge, Springfield, Mo.; bids in.

138 tons, I-beam bridge, Berks county, Pennsylvania; bids to state highway department, Harrisburg, Pa., May 13.

130 tons, overhead bridge, project FAS-19, Pawnee City, Nebr.

130 tons, school building, Holy Name of Mary parish, Valley Stream, N. Y.

115 tons, building, American Tobacco Co., world's fair, New York.

115 tons, Baird street bridge, Green Bay, Wis.; bids in.

110 tons, I-beam bridges, Vershire and Irasburg, Vt.; Warnard Construction Co., Cambridge, Mass., low on general contracts, bids April 29.

105 tons, drive piling, drop No. 1, Boulder canyon project, Specification 765; bids May 23.

100 tons, sheet piling, mud-run sanitary sewers; bids May 10 to city of Akron, O., department of public service, division of sewage.

Unstated tonnage, school, Rushville, N. Y.; bids May 17.

Unstated, stop log guides and appurtenances for 18 main penstocks, Coulee dam, Spec. 781; bids to bureau of reclamation, Denver, May 20.

Unstated, state span, Coos county, Oregon; Tom Lillebo, Reedsport, Oreg., general contractor.

Unstated tonnage, Cherry street bascule bridge, Milwaukee; bids about July 1.

Reinforcing

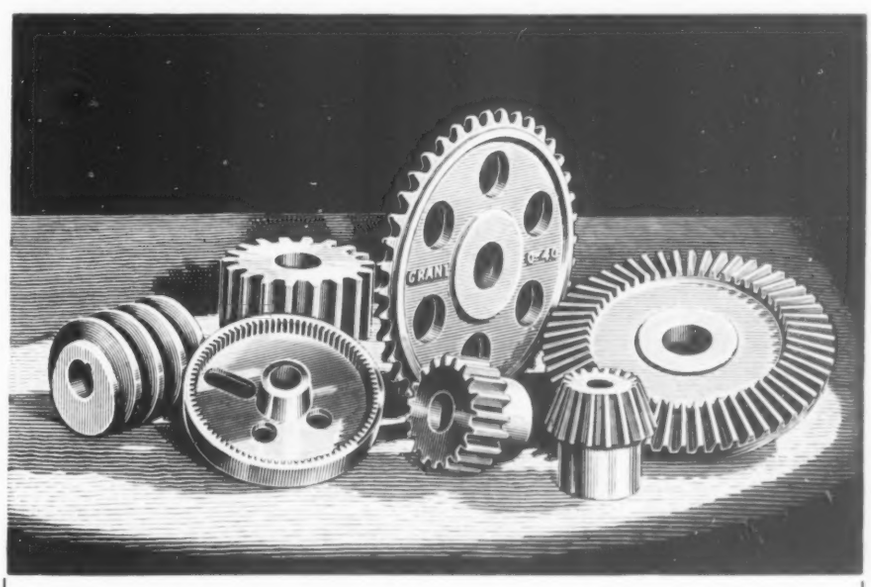
Reinforcing Bar Prices, Page 73

New York—Dullness prevails in steel reinforcing, a situation likely to continue for several weeks. Practically all large pending projects have been placed, but small-lot demand shows some gain, notably for world's fair buildings. Highway mesh, approximately 1500 tons pending, is the most active at the moment.

Pittsburgh—Inquiries for reinforcing steel have fallen off and the outlook is not encouraging. A number of fair sized tonnages are to be placed, however, and another group of projects which are being held up. Shipments have been good recently.

Cleveland—Reinforcing bar sales in northern Ohio from private sources totaled 748 tons in April, a substantial percentage gain over the 186 tons reported for March. Estimated tonnage of joists was 127 tons in April, against 187 tons in March. Awards are generally well under 100 tons. Fabricated prices continue unsteady.

Chicago—Distributors report scarcity of large projects, and while new business is sustained fairly well by



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"Good Gears Sixty Years"

small orders, no marked change in rate of shipments is in early prospect. Most larger inquiries are for public work.

Boston—Buying in small lots holds well, but few large inquiries for reinforcing steel are pending, most demand being for Connecticut highways, bridges and hospital. Prices have weakened in some recent transactions.

Philadelphia — The Woodward-Lathrop warehouse job in Washington, on which bids are in, will require 1750 tons rather than the 1500 previously estimated. This work also will take around 300 tons of shapes for track supports. U. S. engineers, Baltimore have taken bids on an additional 300 tons of bars for the Kingston, Pa., flood control project. The Mt. Gretna prison job, taking about 1500 tons of bars, will probably be out for new bids shortly.

San Francisco — Reinforcing bar market was most active one of the week, with 1417 tons booked, bringing for year to 35,879 tons, compared with 30,665 tons last year. Among the larger awards were 200 tons for a hospital and a school at Anchorage, Alaska and 201 tons for four bridges in Santa Barbara county, California. Bids will be opened May 17 for 600 to 700 tons for a ward at the state hospital at Napa, Calif.

Seattle—Inquiry is slack and local rolling mills are operating on sharply reduced schedules. Lack of private construction is contributing to the depressed market. Washington state opened bids May 3 for several highway jobs involving 435 tons. Snook Bros., Eugene, Oreg., have the contracts for two state spans in Washington and Columbia counties, Oregon, tonnages unstated.

Concrete Bars Compared

	Tons
Week ended May 7	**2,904**
Week ended April 30	**8,003**
Week ended April 23	**10,401**
This week, 1937	**5,751**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**5,603**
Weekly average, April	**8,512**
Total to date, 1937	**81,565**
Total to date, 1938	**106,450**

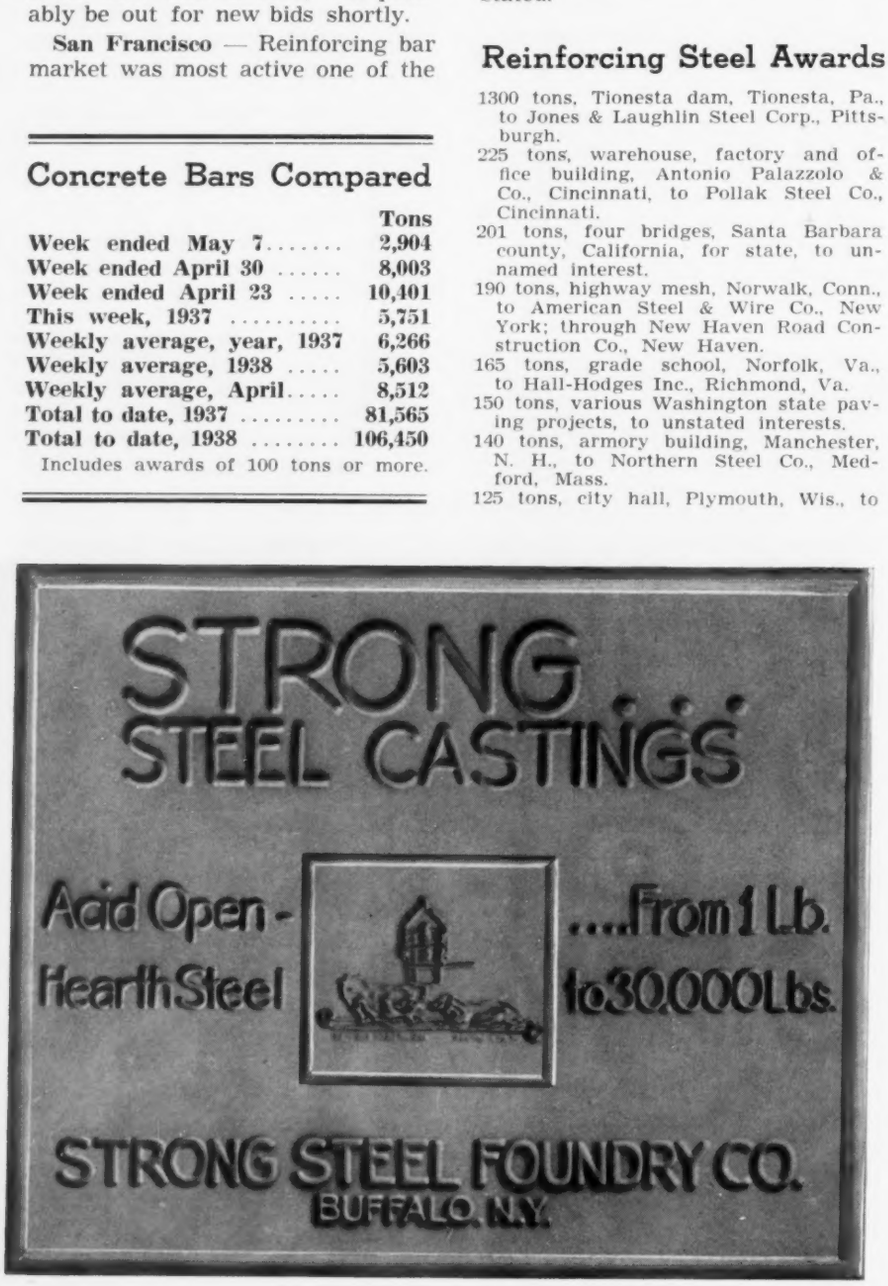
Includes awards of 100 tons or more.

Reinforcing Steel Awards

1300 tons, Tionesta dam, Tionesta, Pa., to Jones & Laughlin Steel Corp., Pittsburgh.
225 tons, warehouse, factory and office building, Antonio Palazzolo & Co., Cincinnati, to Pollak Steel Co., Cincinnati.
201 tons, four bridges, Santa Barbara county, California, for state, to unnamed interest.
190 tons, highway mesh, Norwalk, Conn., to American Steel & Wire Co., New York; through New Haven Road Construction Co., New Haven.
165 tons, grade school, Norfolk, Va., to Hall-Hodges Inc., Richmond, Va.
150 tons, various Washington state paving projects, to unstated interests.
140 tons, armory building, Manchester, N. H., to Northern Steel Co., Medford, Mass.
125 tons, city hall, Plymouth, Wis., to Calumet Steel Co., Chicago.
108 tons, highway work, Cochise county, Ariz., to unnamed interest.
100 tons, Llagas Creek bridge, Santa Clara county, California, for state, to San Jose Steel Co., San Jose, Calif.
100 tons, catholic hospital, Anchorage, Alaska to unnamed interest.
100 tons, school, Anchorage, Alaska, to unnamed interest.

Reinforcing Steel Pending

9000 tons, Grand river dam, Vinita, Okla.; bids June 3.
1300 tons, industrial school for boys, White Hills, Pa., for Pennsylvania state authority.
1000 tons, estimated, sewer, Bronx, N. Y.; bids May 17.
600 tons, female custodian ward, state hospital, Napa, Calif.; bids May 17.
550 tons, highway projects, New York state; bids closing May 17, Albany.
435 tons, various Washington state highway jobs; bids in.
409 tons, gymnasium, George Washington high school, San Francisco; bids opened.
375 tons, flood protection works, Springfield, Mass.
350 tons, ward, for state hospital, Agnew, Calif.; bids opened.
338 tons, super-structure, State Products Terminal building, San Francisco; general contract to F. C. Amoroso & Sons, San Francisco.
300 tons, additional requirements, flood control project, Kingston, Pa.; U. S. engineers, Baltimore; bids in.
284 tons, invitation ER 868-38-141, United States Engineer office, San Francisco; bids opened.
260 tons, rail steel, storm outlet, West Market street-Hawkins avenue, Akron, O.; bids May 10.
250 tons, sewage treatment works, Wards Island, N. Y.
235 tons, nine land piers, Main street bridge project, Cleveland; A. J. Forschner Co., Chicago, low.
126 tons, dam, Hollister, Calif.; bids opened.
100 tons, state cancer clinic, Buffalo; rebid, May 19.
100 tons, Central high school, Ft. Wayne, Ind.
100 tons, Southwest high school, Ft. Wayne, Ind.



Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Chicago—In the absence of improved demand from miscellaneous consumers and with railroad needs still depressed sharply, business in bolts, nuts and rivets continues slow. Operations of farm equipment manufacturers are tending downward although specifications from this industry still provide considerable support. Orders from jobbers are light. Prices are irregular, concessions being not uncommon on certain grades.

Eastern bolt and nut makers find much hope for added business in ship and railroad demand as a result of 12 ships placed by the maritime commission, with eastern and southern yards and award of 5550 freight cars by the Southern railway. Actual orders are light, with eastern plants averaging less than 25 per cent.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh—Demand for pig iron is slight, with only occasional carloads being shipped. Foundry activity is low. There have been no indications of price weakness and it is generally conceded third quarter prices will be on the present basis.

Cleveland—Pig iron sellers report demand has failed to register improvement this month. Foundries serving agricultural implement manufacturers have further curtailed operations, and railroad equipment and auto parts foundries continue to operate at the low levels of April.

Chicago—Pig iron shipments are holding about the rate a month ago when a moderate decrease was shown from March deliveries. Foundries are showing extreme caution in placing new orders, tonnages being taken accommodating requirements for only a few weeks ahead. Trend in foundry operations is downward slightly, some curtailments, such as in the farm equipment industry, being seasonal.

Boston — Still tapering, pig iron buying has gone to the lowest point in months. Only a few scattered car loads are being placed. Foundries in some instances are taking truck lots. Steel works are not buying. Melt has slipped to the lowest point of the year with practically all types of foundries affected.

New York — The Troy, N. Y., furnace went into blast last week after having been out since late last fall. This action, it is said, is attributed primarily to the company's mounting supply of coke. Meanwhile, pig iron buying continues exceedingly light, with orders confined largely to single carlots.

Philadelphia—According to tentative plans, the Swedeland, Pa., stack will blow out around May 20. Coke plant will continue in operation. Character of current pig iron buying shows no change over past several weeks. Consumers are confident no upward price changes are in prospect and therefore, continue to buy on a hand-to-mouth basis. Sellers report unfilled orders are at lowest level in several years. April shipments were approximately 10 per cent less than in March.

Buffalo—Pig iron shipments are marking time. May started with consumers still buying in limited lots for immediate needs. Occasional sales of 200 tons are reported but producers report little forward buying. Melters are operating an average of two days a week. Inventories of some large foundries are still fairly large.

Cincinnati—Pig iron shipments give little encouragement for improvement over April. Occasional purchases in carload lots are made but many foundries are still specifying against contracts or drawing on inventory. Foundry melt is on reduced schedules, district averages being affected by lessened demand for machine tool castings and failure to attain volume on automobile parts.

St. Louis — Consumer pig iron stocks are lower. While the melt has not gained perceptibly, moderate betterment in purchasing is noted. Steel casting plants catering to the railroads are operating at the lowest rate in many months. American Car & Foundry plants in this area are down, but the St. Louis shop will resume operations soon and will be busy about a month on an order for 1250 gondolas from the Southern railway.

Stove manufacturers have stepped up activities. Some small orders have been booked, but work is mainly on stock stoves for fall distribution. Conditions among the jobbing foundries continue spotty. Plants specializing in small castings for the electrical industry have a good volume. Final reports indicate that April shipments were slightly below the March total, the discrepancy being accounted for by the shorter month, as the daily average movement showed practically no change.

Toronto, Ont. — General conditions in the pig iron markets show little change. While local blast furnace representatives say no general revision has been made in pig iron prices, summer schedules have gone into effect at some ports on the Great Lakes at reduced carrying costs.

Current sales of iron are in lots of 50 to 500 tons, with awards holding around 2000 tons per week. Melters covered by contract for second quarter are taking scheduled delivery resulting in movement of between 3500 and 4000 tons of iron per week. Production is unchanged with six stacks blowing.

Scrap

Scrap Prices, Page 76

Pittsburgh—Scrap markets here are still in the doldrums, with mills not interested in buying and production making little inroad on stocks. The price does not seem particularly weak although there are occasional sales of distress material at prices somewhat under the quoted delivered price yet still within the quoted range. On some sales of specialties substantial cuts have been reported but these sales are isolated and involve only small quantities.

Cleveland—Navigation having opened on the Great Lakes, movements of iron and steel scrap by vessel have begun between various lake ports. Within the past few days two cargoes of pressed sheet scrap have been unloaded at Cleveland for local consumption. The first ship brought material from Detroit, and the other from Muskegon, Mich.

Almost no activity exists in the

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It's true that the "condor" is a mighty big bird, but not so big as to need Cage Chains! McKay makes these chains for use as lifts on mine cages or elevators—and this is but one of the types that demonstrate the value of

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McKAY BUILDING, PITTSBURGH, PA.

scrap markets. Quotations are unchanged, with consumers apparently not interested.

Chicago—Scrap trading is dull. Mills are out of the market and brokers and dealers have little incentive to buy for speculation. Offerings are moderate, however, and prices are fairly steady although the absence of sales of some grades makes quotations nominal. Heavy melting steel remains $11 to $11.50.

Boston — Limited mostly to small shipments to district foundries with aggregate tonnage light, iron and steel scrap continues listless with steelmaking grades inactive. Buying against export orders continues to drop. Prices are easier, notably on cast grades for district delivery, brokers having lowered buying price to $7.50, cars.

New York—Although dull for weeks, iron and steel scrap demand has slipped even lower. Steelworks in the East are buying little and shipments are light. Foundries are taking little material with operations low. Having covered against immediate export requirements, buying for barge delivery is also light. The price trend continues easy.

Philadelphia—Iron and steel scrap shows further easiness with No. 1 heavy melting steel down to a range of $12 to $12.50. Small lots of No. 1 steel are reported to have changed hands at $12, although new compressed sheets on the list of a local automotive interest are said to have brought $10 a ton, f.o.b. plant, or $12.50, Steelton, Pa. The May accumulation of this interest is estimated at 2000 tons, compared with 2200 in April. According to reports in the trade, the Pencoyd interest has disposed of most of its scrap inventories on the basis of $11.75, f.o.b. cars, for No. 1 and $9 for new compressed sheets. No. 2 steel is easier in the general market with transactions reported at both $10 and $10.50. Several other grades are contributing to further weakness including specialties, blast furnace grades and stove plate. Some new export buying is expected on the part of Italy but otherwise the foreign market is extremely quiet.

Buffalo—Approximately 5000 tons of scrap moved into yards of the main consumer last week on the recently reduced bids. The mill is maintaining a bid of $11.50 for No. 1 heavy melting steel with a $2 differential on No. 2 steel, compressed sheets, drop forge flashings and busheling. The mill is taking in No. 2 bundles at $8.50 a ton.

A weak tone dominates the market with sellers willing to accept bid prices rather than leave scrap lay in yards and deteriorate.

Detroit—Beyond development of additional weakness in bundles, the scrap market appears to be holding its own. On the basis of recent sales, compressed sheets are revised to an $8 per ton maximum. Some lists came up for bids last week, but no sharp deviations from present levels were indicated.

Small chance is seen of improvement in steelmaking locally until September, presaging an unusually quiet summer.

Cincinnati—Weakness in iron and steel scrap is reflected in a further downward revision in some items, although heavy melting steel remains nominally unchanged at $8 to $8.50. Brokers still face the barrier of mill inventories in trying to stimulate consumer business.

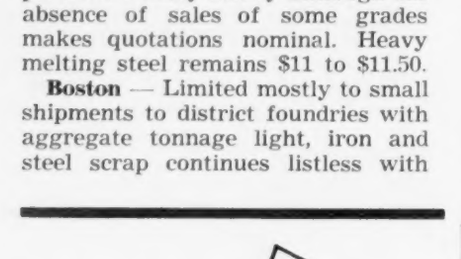
St. Louis—The market for iron and steel scrap has reached the quietest status so far this year and there is nothing to indicate a revival soon.

Quotations were unchanged during the past week, and while prices are nominal in many instances, there is no pressure to sell and the market is in a position to strengthen with any show of buying activity.

Seattle — While dealers report sales lagging, exports to Japan continue in limited tonnages. Domestic demand is slow, mills are out of the market and foundry requirements are of small importance. Tidewater stocks are comparatively low as receipts are light. No. 1 scrap is generally quoted unchanged at $10 to $12.

Toronto, Ont. — Trading in iron and steel scrap is specialized and spotty. Demand for heavy melting steel is holding and Hamilton mills are taking delivery as offered by dealers. The latter, however, carry only small stocks and shipments are below the average of last year. Stove plate and machinery cast also have good call, with stocks limited.

Other grades are moving slowly but dealers look for export market demand to take care of their surplus holdings. New offerings of scrap have increased recently but the lines offered are those with little resale demand. Prices show a softer tendency and lists have been marked down $1 per ton by local dealers.



This illustrates one of our larger perforations—slugs from the holes are about the size of twenty-five cent pieces. The comparison ends there, we are sorry to say, but it gives you some idea of how *large* we go.

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Warehouse

Warehouse Prices, Page 75

Philadelphia—One or two district jobbers reported an increase in April over March but total volume was off 10 to 15 per cent. Relatively speaking, warehouses are booking more tonnage than mills, with lighter products outstanding. Pooling of extras on hot-rolled grades recently has not resulted in much additional business. Prices are fairly steady.

New York—Warehouse volume is light, the slight decline which developed late last month still evident. While the number of orders is holding, tonnage per order is light with practically all products moving slowly. Sheets, notably galvanized, are mixed, shading being widespread among many sellers.

Cleveland — Sales and shipments out of warehouse have reversed the gradual downward movement of April, to register moderate gains over the comparable period last month. Most improvement has been in bars and plates with other steel products making less improvement.

Inventory position among many warehouse customers has reached a more satisfactory level, reflected in increasing number of small orders. Prices remain firm.

Buffalo—Warehouse distributors find sales sustain mild improvement of April. Slight tapering in buying is expected, due to seasonal influences. Prices are unchanged with a steady to strong tone in all items except galvanized sheets, where softness is noted.

Chicago — Business is resisting seasonal influences which usually restrict activity at this period. April sales showed little change from March though the peak during the second week exceeded the best weeks of the three preceding months.

Cincinnati—Warehouse sales are barely holding to recent levels and seasonal influences may pull tonnage below shipments in April unless there is unexpected activity in building. Prices are firm and unchanged except for recent minor changes in freight rates. Outlook for remainder of quarter is uncertain.

St. Louis—April sales were slightly below March and 25 per cent less than April, 1937, total. Losses as contrasted with a year ago were spread over all lines, but were most pronounced in building materials. There have been several favorable spots, the most outstanding being oil country goods, principally drilling and drilling machinery supplies. Warehouse stocks are generally ample for all present demands, and assortments are for the most part complete. There is a fair movement of special steel sheets.

Seattle — Jobbing business is spotty, the market having no definite trend. Turnover is far below a year ago and also below seasonal normals. Orders are in small lots. Some foreign materials are being received but not in sufficient tonnages to disturb the market, price schedules being generally maintained.

Tin Plate

Tin Plate Prices, Page 72

New York—Tin plate buying continues to reflect the lull that set in 10 days or so ago following the letter of the American Can Co. to customers indicating that prices are being shaded and offering a protection on yearly contracts. Until there is clarification as to the future trend in prices tin plate buyers are likely to move cautiously. It is suggested in some quarters that should a general revision be made (leading sellers meanwhile claim they have made no concessions) it will not come until time for steelmakers to open books for third quarter, possibly near the end of this month.

Pittsburgh—Specifications against standing orders for tinplate have dropped and the usual backlog of orders is low. The price situation remains firm. Specifications have been pared to absolute necessities in the fear that a cut might be placed in effect for third quarter deliveries. There has been no indication, however, that there will be such action.

Iron Ore

Iron Ore Prices, Page 76

Cleveland—Shipments of iron ore from upper lake ports in April amounted to 260,513 tons, compared with 3,770,555 tons, the all-time record April shipment last year. The Lake Superior Iron Ore association reports the April movement from ports as follows:

Port	April 1938	April 1937
Escanaba	22,361	449,821
Marquette	.....	308,400
Ashland	10,176	153,773
Superior	218,594	1,204,169
Duluth	.....	933,378
Two Harbors	9,383	721,014
Total	260,513	3,770,555

Steel in Europe

Foreign Steel Prices, Page 75

London — (*By Cable*)—Pig iron markets in Great Britain continue dull, consumers using stocks, in expectation of a price revision. Producers of pig iron are still awaiting reimposition of the full import duty.

Steel output remains at a high rate, making deliveries on past contracts. New business is light but expectations are held for further tonnage for the rearmament program. Inquiries for steel for export are expanding, South Africa being a fairly good market.

The Continent reports the recent slight improvement is being maintained, especially for deliveries to the Far East and South America.

In reply to a question in the house of commons Capt. E. Wallace stated that application for imposition of a duty on imported pig iron is being considered by the import duties advisory committee and that announcement is to be made shortly.

Ferroalloys

Ferroalloy Prices, Page 74

New York — Shipments of ferromanganese this month are barely sustained at the April rate, and this also applies to most ferroalloys. The light movement is in line with limited steel output.

Ferromanganese is unchanged at $102.50, duty paid, Atlantic and Gulf ports and domestic spiegeleisen, 19 to 21 per cent, at $33, Palmerton, Pa., and 26 to 28 per cent at $39.

Much Ore Imported

Philadelphia—Six thousand tons of chrome ore were brought in from Turkey during the week ended April 30, with 115 tons of steel sheets, 15

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tons of steel bars and 153 tons of structural shapes from Belgium and five tons of bars and 63 tons of shapes from France.

Baltimore—Ore arrivals here between April 21 and 25, inclusive, include 21,500 tons of iron ore from Cruz Grande, Chile, April 21; 6749 tons of iron ore Narvik, Sweden, April 22; 3048 tons of chrome ore from Fethrye, April 21; 3465 tons of chrome ore from Lorenco Marquis, Portuguese East Africa, April 25, and 9500 tons of manganese ore from Rio de Janeiro, April 24.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Apr.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
30	10.00	10.12½	9.52½	36.25	36.40	4.50	4.35	4.15	20.00	13.25	35.00
May											
2	10.00	10.12½	9.52½	36.25	36.40	4.50	4.35	4.15	20.00	13.25	35.00
3	10.00	10.12½	9.52½	35.10	35.25	4.50	4.35	4.15	20.00	12.75	35.00
4	10.00	10.12½	9.52½	36.85	37.00	4.50	4.35	4.15	20.00	12.75	35.00
5	10.00	10.12½	9.52½	37.50	37.70	4.50	4.35	4.15	20.00	12.75	35.00
6	10.00	10.12½	9.52½	37.40	37.60	4.50	4.35	4.15	20.00	12.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c Conn. copper

Sheets

Yellow brass (high) 16.37½
Copper, hot rolled 18.12½
Lead, cut to jobbers 7.75
Zinc, 100-lb. base 9.75

Tubes

High, yellow brass 19.12½
Seamless copper 18.62½

Rods

High yellow brass 12.37½
Copper, hot rolled 14.62½

Anodes

Copper, untrimmed 15.37½

Wire

Yellow brass (high) 16.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York 5.97½-6.10
*Cleveland 6.25-6.50
*Chicago 5.25-5.50
St. Louis 5.37½-5.62½

Heavy Copper and Wire

*New York, No. 1 ..... 7.00-7.25
*Cleveland, No. 1 ..... 7.00-7.25
*Chicago, No. 1 ..... 7.00-7.25
St. Louis 6.75-7.00

Composition Brass Borings

*New York 5.60-5.72½

Light Copper

*New York 5.50-5.75
*Cleveland 5.50-5.75
*Chicago 5.00-5.25
St. Louis 5.00-5.25

Light Brass

Cleveland 3.25-3.50
*Chicago 3.25-3.50
St. Louis 3.25-3.50

Lead

New York 3.50-3.75
Cleveland 3.25-3.50
Chicago 3.00-3.25
St. Louis 2.75-3.00

Zinc

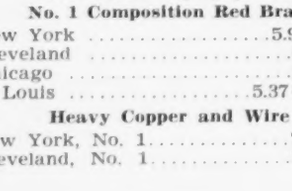
New York 1.75-1.87½
Cleveland 1.75-2.00
St. Louis 1.75-2.00

Aluminum

*Borings, Cleveland 3.75-4.00
*Mixed, cast, Cleveland 6.75-7.00
*Clips, soft, Cleveland 11.25-11.50
*Mixed cast, St. Louis 7.50-7.75

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads .. 10.25
Standard No. 12 aluminum 14.25-14.75



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Coke By-Products

Coke By-Product Prices, Page 73

New York—Light demand for coke oven by-products is balanced by curtailed production, there being no burdensome accumulation. Only sulphate of ammonia is active, shipments being seasonally high against contracts with a substantial volume of spot buying by fertilizer interests. Chemical industries are taking small shipments of phenol. Industrial demand for naphthalene is slow, but fairly active with jobbers for household use. Of the distillates, supplies of benzol are short in spots with xylol, toluol and solvent naphtha inactive. Prices are unchanged.

Nonferrous Metals

New York—Announcements that foreign copper producers had agreed to renew the cartel indefinitely and that a referendum would be held in Malaya shortly on the question of forming a buffer tin pool within six months were the outstanding developments in nonferrous metal markets last week. Prices tended lower in London early in the week then stiffened on subsequent trading.

Copper—Sales in the foreign market continued to exceed those here. Export copper advanced to around 9.75c then eased to the closing level of around 9.60c, c.i.f. Sales here were light at 10.00c, Connecticut.

Lead—Prices held unchanged at 4.50c, New York, and 4.35c, East St. Louis. The March statistical report, showing an increase of 5276 tons to a total of 221,346 in total refiners' and smelters' stocks, failed to affect the undertone.

Zinc—Prime western zinc held steady at 4.15c, East St. Louis, despite dull demand. The market held in face of an increase of 17,229 tons in stocks during April to 135,238 tons.

Tin—Straits spot tin dropped to a new 5-year low at 34.75c early in the week before rallying on strength of the buffer pool proposal to around 37.40c at the close of the week. The lower price level attracted moderate inquiry from consumers but failed to bring out much speculative interest.

Antimony—With American spot antimony at 12.75c sales were the heaviest for any period so far this year. Chinese spot held nominally unchanged at 15.25c, duty paid New York, in a dull market.

World Tin Consumption And Production Decline

■ Consumption of tin in the first two months this year amounted to 26,400 tons, 5100 tons less than in the same months of 1937, according to the current statement by the International Tin Research Development council. In the same period world production fell only 1500 tons to 26,800 tons.

Consumption statistics for the United Kingdom to the end of March show a shrinkage of 31 per cent from 6354 tons in first quarter, 1937, to 4378 tons in the same period this year.

In the 12-month periods ending with February, 1937 and 1938, the largest increase in consumption was 161.1 per cent, by the U.S.S.R., which took 26,722 tons, compared with 10,236 tons. Consumption in the United States in this period increased 4.4 per cent, from 77,030 tons to 80,388 tons. In the United Kingdom the gain for the same period was 13.2 per cent, from 21,627 tons to 24,483 tons.

National Transportation Program Is Outlined

■ Taking a broad view of transportation, railroads, trucks, waterways and airlines, the Transportation Association of America, 400 West Madison street, Chicago, has issued two booklets on a national transportation program. One contains recommendations and conclusions reached after three years of intensive study and the other presents historical and factual data assembled in support of the proposals.

The association seeks a sound, permanent national transportation policy, including all types of facilities for efficient handling of commerce; government regulation strictly limited to the degree necessary to protect the public interest in efficient, uninterrupted service at reasonable rates; continuance of transportation as a private enterprise, paying a fair rental for use of roadways and waterways.

Revere Reduces Price On Revecon Molding

■ Revere Copper & Brass Inc., New York, has announced price reduction on Revecon extruded aluminum structural moldings. New prices are designed to extend further the use of these sections by pricing them at a point competitive with methods not possessing similar advantages.

The sections provide a simple, efficient medium for holding flat sheet material to any type of superstructure, with no exposed attaching device. They are stocked in Revere mills at Baltimore, Chicago, Detroit, New Bedford, Mass., Rome, N. Y., and Los Angeles. The new price list will be mailed on request.

Equipment

New York — Machine tool orders are few, limited to one or two units at time from widely diversified users. Some eastern shops are now supported largely by moderate backlogs of foreign tool business. Among the latter, however, is a 56-inch hot and cold mill for the Wheeling Steel Corp., Portsmouth, O. plant.

Two three-high steels mills, Kokomo, Ind., and one three-high mill at East Canton are being built by Continental Roll & Steel Foundry Co., the units being about ready for erection. Japanese interests have also asked estimates on a 56-inch hot and cold continuous strip mill to be erected in China, near Shanghai. Mesta Machine Co. is reported assembling estimates on a 80-inch hot and cold strip mill for Japan. United Engineering is also figuring a 46-inch hot and cold continuous strip mill for another installation in England.

Boston—Machine tool buying continues slack, domestic orders being confined to scattered one or two-unit purchases with some spotty foreign business still being taken by district shops. Domestic backlogs are well depleted, current activity being devoted to foreign requirements in numerous instances. Government shop inquiry continues steady. Navy department has placed sensitive drills with Leland-Gifford Co., Worcester, Mass., against the opening of March 15.

Chicago — Most equipment markets continue slow and the trend in sales in most instances is sidewise. Occasional betterment has occurred in demand for certain types of machinery but these changes have not been sustained. Machine tool orders have varied little the past 30 days, with business still receiving considerable support from export needs. Inquiries invariably are for one or two items, the only outstanding lists being those of the Santa Fe and Milwaukee roads, against which some orders remain to be placed.

Cleveland — Machine tool and equipment market is dull and spotty. April sales were on par or slightly above March and May has started at about the same level. Inquiries and sales generally are in small items for replacement or repairs. No large lists are pending. Export demand continues an important factor although considerably below several months ago.

Seattle — Demand from industrial sources is lagging although mining operators are placing seasonal requirements. Electrical equipment and pumping units are moving actively. WPA purchases are small. Seattle is considering installing parking meters.

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Construction and Enterprise

New York

BINGHAMTON, N. Y. — Agfa Ansco Corp., Charles street, will receive bids in May for constructing 4-story factory. Lockwood Greene Engineers Inc., 30 Rockefeller Plaza, New York, engineer. Estimated cost $150,000.

NEW YORK — R. C. Stanhope Inc., 101 West Thirty-First street, dealer, plans buying hoist; single drum, incline shaft, with clutch to handle 14,000-pound pull, 700 feet per minute, 1800 feet 1¼-inch cable capacity, alternating-current motor.

OSSINING, N. Y. — Request was filed with village trustees for a zoning variance on property adjacent to present plant of Cambridge Instrument Co. for construction of a $200,000 addition; cost of plant $100,000; purchase of equipment another $100,000; R. H. Kruse, president.

YONKERS, N. Y. — Cost of Habirshaw Cable & Wire Corp's expansion program was fixed at $871,000 by Phelps Dodge Corp., parent firm; equipment to be bought; Louis S. Gates, president, parent company.

Ohio

CLEVELAND — Linderme Tube Co., 1291 East Fifty-Third street, expects to move in July into its $150,000 plant at 219th street and Nickel Plate railroad, Euclid, O.; Emil Linderme, president.

Michigan

DETROIT — Decker Engineering & Mfg. Corp., 8016 Prairie avenue, has been incorporated, and to manufacture chemicals; Earl Decker, 16158 Littlefield avenue.

DETROIT — Central Tool & Die Co. Inc., 2279 East Kirby avenue, has been incorporated; to make tools; James H. Kramer, 12840 Glendale avenue.

DETROIT — Thermo Beverage Cooler Inc., 407 Guaranty building, has been incorporated; to make cooler equipment; M. E. Thompson, 7739 West Vernor.

FLINT CITY, MICH. — Commission has authorized officials to submit new WPA project which will involve an expenditure of $2,344,805; project consists of street and sewer improvements.

KALAMAZOO, MICH. — Preliminary plans have been completed for construction of a water supply system in Kalamazoo township, near southwestern section of city; cost $100,000.

Illinois

CHICAGO — Skelly Oil Co., Forty-seventh and Penn streets, Kansas City, Mo., plans constructing refinery and storage building at 4820 South Richmond street, Chicago. Estimated cost $100,000.

CHICAGO — Processed Steel Corp., 410 North Michigan avenue, has been incorporated; 2400 shares par value, common at $10 per share. Incorporators: E. F. Smith, J. L. Lundberg, W. B. Snyder. To purchase and sell all types of metal machinery and equipment; correspondent, Otto F. Ring; Ring, Uhlier & Cuchna, 125 West Madison street.

CHICAGO — Compressed Industrial Gasses Inc. has contracted for a new plant at Conshohocken, Pa., for the manufacture of oxygen and acetylene. Plant involves two buildings, brick and steel construction; including equipment; project involves about $250,000; F. R. Heavner, Pittsburgh, contractor; work expected to be completed June 1.

CHICAGO — Atlas Machine Co., 2714 South Canal street, has been incorporated; 20 shares par value, common at $50 a share. Incorporators: R. Manning, M. Manning, D. M. O'Neill; to manufacture machinery tools, parts of machinery and similar articles of commerce from iron, steel or other metals; correspondent; Leo B. Lowenthal.

Indiana

EVANSVILLE, IND. — Fire caused $10,000 damage at the plant of Steel Scaffolding Co. recently, destroying much machinery.

PRINCETON, IND. — Highway Machine Co. Inc. has been incorporated to manufacture and sell machinery and tools with 50 shares of capital stock, $100 a share; incorporators are Henry P. Smith, Uriah R. Smith and Morton C. Embree.

RICHMOND, IND. — Henry D. Holzapfel's Sons' Iron & Metal Corp., has been incorporated to deal in new and used iron and scrap with 100 shares no par value capital stock; incorporators are Nellie Barth, Doris Gillespie and Max Klezmer.

Alabama

BIRMINGHAM, ALA. — W. M. Smith & Co., Forty-Fifth to Forty-Eighth streets, First avenue, North, dealer, plans buying rails, 12 to 15 miles, 40 to 60 pounds.

COURTLAND, ALA. — City, W. A. Toms, mayor receives bids May 25 for installing electric distribution system; John M. Gilfillan & Associates, 1425 South Twenty-Eighth street, Birmingham, consulting engineers.

District of Columbia

WASHINGTON — Navy department bureau of supplies and accounts takes bids to 10 a.m., May 17, schedule 3283, for gaskets, boiler; delivery various east and west coast points; schedule 3394, for chains, without flights, links, socket carrier; delivery Washington; schedule 3404, for shafts, propeller, and billets for shafts; delivery Norfolk, Va., and Mare Island; schedule 3410, for ovens, baking, electric, ship's, and spare parts; delivery San Diego, Calif.; schedule 3411, for cable, steel, flexible; delivery San Diego, Calif.; schedule 3415, for hammer, steam, forging; delivery Mare Island, Calif.; schedule 3420, for machine grinding, surface, rotary, motor-driven; delivery various east coast points; schedule 3421, for machine, milling, high speed, motor-driven; delivery various east coast points; schedule 3427, for brass, naval rolled; sheets and angles; delivery Portsmouth, N. H., and Mare Island, Calif.; schedule 3428, for bus, motor, new, latest model; delivery submarine base, Conn.; schedule 3429, for filters, for feed heater drain; tools and wrenches and spare parts; delivery Brooklyn, N. Y.; schedule 3435, for joints, universal, steel; delivery various east and west coast points; schedule 3437, for machine, cylindrical grinding, motor-driven; delivery Newport, R. I.; schedule 3438, for machines, arc welding; delivery San Diego, Calif.; schedule 3441, for lathe, bench, motor-driven, without bench or cabinet; delivery Boston; on May 20, schedule 3384, for cable, electric, heat and flame resistant; delivery Portsmouth, N. H.; schedule 3426, for tubing, copper-nickel alloy; delivery Mare Island, Calif.; schedule 3439, for anchors, folding, and clamp; delivery Brooklyn, N. Y.

Kentucky

ASHLAND, KY. — Ashland Oil & Refining Co., Ashland, Ky., plans constructing a new gasoline distillation plant and other improvements at its refinery. Estimated cost of the project, $750,000.

Mississippi

ABERDEEN, MISS. — City has plans for municipal light and power distribution system, using TVA current; Beard Engineering Co., 2606 Terrace, St. Louis, Mo., engineers.

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BELLEVUE-STRATFORD

CLAUDE H. BENNETT, *General Manager*

GREENWOOD, MISS. — Water & Light Co., Bonner Duggan, secretary, will receive bids May 14 for one stoker-fired boiler, complete with appurtenances.

LAUREL, MISS. — Southern Pine Electric Power Association, S. D. Russell, president, will let contract June 30 for construction of 237 miles of rural electric lines in Jones, Covington, Smith and Jasper counties; $225,000 allocated by REA to start construction of 177 miles of power line in Jones, 22 miles in Covington, 20 in Smith and 18 in Jasper counties.

MISSISSIPPI, MISS. — Mississippi Valley Equipment Co., Chamber of Commerce building, St. Louis, Mo., dealer, plans buying steel water tanks 50,000 gallons on 100-foot tower, 100,000 gallons on 100-foot tower; creosoting plant; 1 or 2 cylinders, or separate creosoting cylinders 6 to 10 feet in diameter by 100 feet long.

North Carolina

BURLINGTON, N. C. — Bryan & Baliff, has contract for addition to plant of Rufus D. Wilson Full Fashioned Hosiery Mills; install new machinery including 20 full fashioned machines.

CHARLOTTE, N. C. — City, Ben Douglas, mayor, considering securing additional funds for extension of runways at Juneau airport and for construction of additional hangar; estimated cost $35,000.

HENDERSONVILLE, N. C. — H. G. Carlisle and associates soon begin work on a $40,000 canning plant; operate as Skyland Packing Co.

ROCKWELL, N. C. — City votes May 23 on $44,000 sewer and water system construction bonds.

STONEVILLE, N. C. — City proposes to construct $76,363 sanitary sewer and water system; O. P. Joyce, mayor; W. F. Freeman, High Point, engineer.

WILMINGTON, N. C. — Ethyl-Dow Chemical Co., Midland, Mich., plans construction of addition to increase production 75 per cent at Kure Beach plant for extraction of bromine from sea water; work to start at once; addition will raise capacity of plant for processing raw sea water from 137,000 gallons per minute to 200,000 gallons per minute; Austin Co., 16112 Euclid avenue, Cleveland, has building contract.

South Carolina

SPARTANBURG, S. C. — City plans $370,000 expansion program at Memorial airport; county board authorized issuance of $82,000 bonds, subject to approval in special election; plans include extension of airport runways and erection of administration building.

Tennessee

CHATTANOOGA, TENN. — Chattanooga Electric Power board approved plans for constructing $100,000 subproject; bids called soon; S. A. Finley, chief engineer; project fourth in a series of 50 or more in erection of a distribution system.

KNOXVILLE, TENN. — City, W. W. Mynatt, mayor, receives bids May 20 for furnishing materials and equipment for an electric distribution system for city; Burns & McDonnell Engineering Co., engineer, 107 West Linwood boulevard, Kansas City, Mo., and Knoxville; contract 4, unit substation equipment; contract 5, main substation equipment; contract 7, watthour meters; contract 8, distribution transformers; estimated cost of total equipment $484,000.

Louisiana

EUNICE, LA.—City is considering construction of electric power plant. Wesley H. Clanton, city attorney.

MINDEN, LA. — Webster parish school board ordered election for May 16 in district No. 6 on $75,000 bonds for constructing combination gymnasium and manual training building.

NEW ORLEANS — Louisiana Materials Co., W. L. Stevens, president, 1510 Julia street, will erect pipe manufacturing plant near Industrial canal on Chief Menteur highway; cost $30,000.

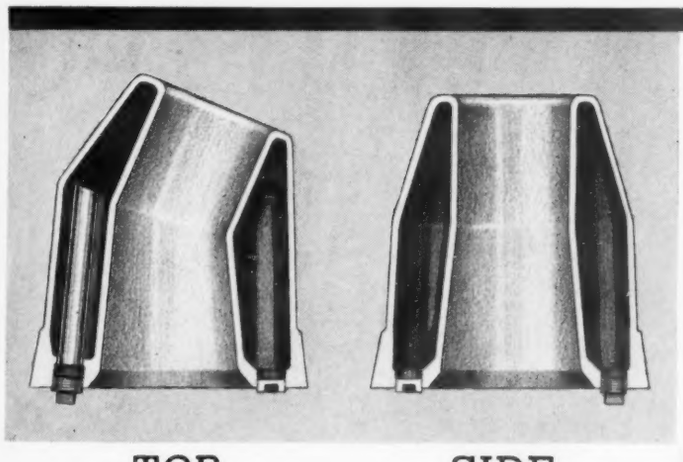
NEW ORLEANS, LA.—United States engineer office, first New Orleans district, 604 Union building, will receive bids May 6 for constructing approximately 1325 feet of steel sheet pile breakwaters at Belle Pass, entrance to bayou in Lafourche parish.

West Virginia

ELKINS, W. VA. — Kenwood Corp., rejected bids for construction of dimension mill in Tygarts Valley, will redesign plant and invite new bids; E. T. Hutchings, architect, 1708 Heyburn building, Louisville, Ky.

Virginia

LYNCHBURG, VA. — City will proceed at once with sewer extension proj-



TOP

SIDE

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The Angle Flow Tuyere is designed to divert the entering air streams horizontally to the right or left.

This type of tuyere has had about two years' use at a single furnace.

It has resulted in lower coke consumption through the ability to use higher blast temperatures. It has also contributed to a greater tonnage, and to other advantages, including more regular quality of iron and a generally improved operation. It is for sale by licensed manufacturers. It is protected by U. S. Patent. For further particulars, apply to

H. A. BRASSERT & COMPANY
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ect in conjunction with WPA; cost $38,000.

ROANOKE, VA. — Southern Machinery & Supply Co., Liberty Trust building, dealer, plans buying a lime hydrator to have a capacity of hydrating about 2 tons of pulverized burned limestone per hour.

WYTHEVILLE, VA. — R. P. Johnson, dealer, plans buying a washer for washing manganese iron ore.

Oklahoma

CRESCENT, OKLA. — City, H. A. McNeer, mayor, will erect 2-story building and 2300 feet of 4-inch water mains; cost $140,000.

OKLAHOMA CITY, OKLA. — City, W. A. Wuinn, manager, plans $9,000,000 improvement program for water and sewage system; may vote on $2,500,000 bonds; plan to obtain $6,500,000 in federal aid.

PURCELL, OKLA. — WPA approved $33,993 project for constructing municipal swimming pool and bathhouse.

Wisconsin

APPLETON, WIS. — Board of education closes bids May 12 for complete laboratory and other equipment for new $1,000,000 senior high school; Carrie E. Morgan, secretary.

MENOMONEE FALLS. WIS. — Business of Dostal-Lowey Co., manufacturing bottle washing machines for breweries, and dairies has been incorporated as Dostal & Lowey Co. Inc., with 500 shares of no par value; Philip C. Read, president.

MILWAUKEE — Municipal harbor commission has awarded contract to American Hoist & Derrick Co., St. Paul, Minn., for furnishing south harbor tract one gas-engine-driven locomotive crane at $24,558.

RHINELANDER, WIS. — Leon Nichols is starting work on a new machine shop, 50 x 100 feet, Wabash street.

Minnesota

KENNEDY, MINN. — Village, Merle E. Johnson, clerk, will vote soon on $15,000 bond issue to aid financing construction of 4 miles of water mains, elevated storage tank, chlorination plant and sewage disposal plant to cost $80,000; project approved by PWA.

LONG PRAIRIE, MINN. — Village council, R. E. Beach, clerk, will decide soon on proposition of drilling new well and purchase of an additional pumping unit.

MADELIA, MINN. — Village, C. E. Seymour, clerk, will hold special election soon to vote whether Interstate Power Co. shall be granted another franchise or if city should build its own municipal electric light and power plant.

MANKATO, MINN. — Blue Earth-Nicollet Cooperative Electric association, Fred D. Weaver, secretary; preparing plans for its second unit consisting of construction 200 miles of feeder transmission lines and 10 miles of main lines to serve about 550 customers; cost $200,000. Expect approval of REA July 1. Ellerbe & Co., 1021 First National bank building, St. Paul, consulting engineer.

WINDOM, MINN.—Cottonwood County association, Edgar C. Rorgers, county agent, filed application with REA for funds to finance construction of rural transmission lines in western part of county.

Texas

ATLANTA, TEX. — Henry A. King, chairman, board of canning Co.; T. O. Ballard, manager; erect $25,000 canning plant; 60 x 140 feet; contracts being let for machinery and equipment.

BELLAIR, TEX. — City plans extending 2000 feet of 6-inch water mains to a 40-acre subdivision under development by Westmoreland Development Co., Houston; G. H. Miles, city secretary.

BELLAIR, TEX. — City has authorized Garrett Engineering Co., 308 Hughes street, Houston, to make survey and prepare plans for sewage system and disposal plant; estimated cost $100,000; G. H. Miles, city secretary; may vote on bonds.

DALLAS, TEX. — City has plans for bids on remaining units in sanitary sewage disposal plant; cost $1,275,000.

DALLAS, TEX. — City, J. B. Winder, water works superintendent, will start engineering survey for construction of sanitary sewer line to serve Bel-Air addition in Northeast Dallas; cost $57,929; WPA approved work, will supply $38,241 of cost; Maurice W. Levy, Lawther drive, owner of subdivision.

FT. WORTH, TEX. — Cosden Petroleum Co., Ft. Worth and Big Springs, Tex., is having preliminary surveys made for an addition to its refinery at Big Springs. Estimated cost $250,000.

HARLINGEN, TEX. — Coastal Chemical Co. plans constructing new plant to replace the one recently damaged by fire.

LIBERTY, TEX. — City, L. C. Steusoff, city secretary, receives bids May 25 for constructing electric lighting and power system, plans from Garrett Engineering Co., 308 Hughes street, Houston; $114,000 available for project.

PORT ARTHUR, TEX. — City is considering plans for $3,148,475 municipal improvement program, including waterworks, storm drainage, sanitary sewers, street, park, playground, public building; $2,056,000 for streets; M. D. Gates, city engineer.

South Dakota

SALEM, S. DAK. — Plans have been discussed and report submitted to village board of trustees favorably by Commercial club for construction of municipal light plant.

Nebraska

FREMONT, NEBR. — Board of Public Works, J. Rex Henry, chairman, is taking bids, which close May 12, 1:30 p.m., on construction of power plant addition estimated to cost $85,000; R. C. Adams, chief engineer, Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineer.

HASTINGS, NEBR. — State Railway commission has granted permission to Central Nebraska Power & Irrigation district to construct 78 miles rural transmission lines in Clay, Adams, Kearney and Phelps counties; R. O. Canaday, secretary, Third street and St. Joseph avenue, same city; H. S. Hunt, Jackson, Mich., consulting engineer.

SOUTH BEND, NEBR. — Ak-Sar-Ben Public Power & Irrigation district, George Voge, same city, has filed petition with A. C. Tilley, state engineer, statehouse, Lincoln, for authority to establish district. It contemplates construction of dam across Platte river, diversion works, irrigation canals, laterals and transmission lines in Sauners, Dougles, Sarpy and Cass counties; cost $1,500,000. Application expected to be made to PWA; H. H. Hennigsen Engineering Co., 326 Union State bank building, Omaha, consulting engineer.

Iowa

CEDAR FALLS, IOWA — City has completed preliminary plans for construction of a sewage disposal plant this summer. C. N. Streeter, city engineer.

DES MOINES, IOWA — Preliminary report has been submitted to city by consulting engineers, Burdick & Howson, Civic Opera building, Chicago, for construction of a water softening plant to cost $959,000; C. Roy Hansen, city clerk.

Pacific Coast

BAKERSFIELD, CALIF. — Certificate to conduct an oil drilling tool business under firm name of Dunlap Welding & Bit Works, 2220 L street, same city, has been issued to owners, R. J. Dunlap and C. L. Rinse.

BURBANK, CALIF. — Cinecolor Inc., 201 North Occidental boulevard, Los Angeles, W. Prynne, in charge of operations, is having plans prepared by Clarence J. Small, 309 South Orlando avenue, Los Angeles, architect, for a film manufacturing plant at 2728 South Olive avenue, Burbank. Estimated cost $100,000.

BURBANK, CALIF. — A new $15,000 hangar addition to the 8½-acre plant of Lockheed Aircraft Corp., in suburban Los Angeles, will be erected immediately for construction of an experimental airplane ordered by an undisclosed customer. Building to be used for further experimental work upon completion of plane.

LOS ANGELES — California Boiler and Tank Works Inc. has been incorporated in Los Angeles county with 2500 shares of capital stock. Directors are; M. A. Jaspersen, Charles R. Weaver and Wesley D. Hunt, Los Angeles.

LOS ANGELES — Certificate to conduct business under firm name of Imperial Machine Co., 5138 East Imperial highway, Lynwood, has been issued to the proprietor, Clayton W. Rees, 5140 East Imperial highway, same city. Plant is in aircraft manufacturing district near Los Angeles municipal airport.

SAN BERNARDINO, CALIF. — A new office, laboratory, garage building and gasoline storage shed will be erected for Ethyl Gasoline Corp.; cost $100,000; structure will cover area of 172 x 183 feet.

EVERETT, WASH. — Texas Co. is remodeling local distribution plant, increasing storage and warehouse capacity, adding tanks and equipment.

SEATTLE — Fire in the frame plant of Star Foundry, 47 Horton street, damaged building and equipment; loss not determined.

SEATTLE — Wash-Ore Recoveries Corp., capital $100,000, has been organized by E. W. Watson and Associates, Smith Tower.

SPOKANE, WASH. — Lewiston, Ida-True's Oil Co. is building a sub-storage and distribution plant here, and plans several other bulk storage plants and service stations in this territory; C. L. True, president.

SPOKANE, WASH. — Inland Empire Refineries has awarded a contract to Winkler-Roche Engineering Co., Tulsa, Okla., for steel vessels, condensers, exchangers and fabricated steel construction of proposed refinery here.